EDITORIAL

Mergers

PURCHASE of the Yellow Cab Manufacturing Co. by General Motors Corp., if completed as now seems probable, marks the second big automotive transaction of the year and the first merger involving important vehicle building organizations.

It was generally predicted that a large number of mergers and combinations would be consummated before 1925 was over. Those expectations have been fulfilled, despite the fact that few of the combines thus far have involved sufficient sums of money to be front page newspaper material.

The Dodge purchase up to the present time has resulted in no merger announcements despite the numerous and persistent rumors which were current at the time the deal was consummated. Possibilities along this line still exist, of course, but less talk of them is heard.

Further consolidations, particularly ones involving smaller organizations in the parts and accessory fields, would not be surprising. It would be a mistake, however, to expect this trend toward combination to extend too far. More mergers are likely, but the smaller outfits aren't all going to be gobbled up.

Development of Air Transport

ONE of the reasons for the comparative slowness of development in commercial aviation is that the necessary experimental or development work cannot be conducted on a small scale. The individual inventor with limited means can readily experiment with the average simple mechanical device, but it takes virtually millions to do experimental work in the aircraft line with any chance of success—especially in the lighter-than-air branch. During the war there was rapid progress in all lines of aerial transport, because immense appropriations were made for the purpose by the various belligerent governments, but it is well remembered what an outcry there was in this country even then when the appropriations were spent and results did not show as rapidly as had been anticipated.

The development of aerial transport is evidently an undertaking for relatively large financial interests.

In this country the most successful aerial transport undertaking to date is the Government Air Mail. This has been in continuous operation now for several years and the scope of the service has been broadened continuously. While the various air transport lines in Europe are under private management, the most ambitious scheme yet conceived, that of an England-India service, is being fostered by the British Government, for which two large dirigibles are being built at the present time and are expected to go into actual service during the course of the next two years.

It is quite evident that the best chance for aircraft exists where the only competing service is by comparatively slow steamers. Still, even on the American Continent there are probably many opportunities for establishing air lines successfully if these opportunities are given proper study and if the enterprises are properly managed from the beginning. In this connection it is certainly fortunate that in this country both the heavier- and the lighter-than-air branches of the industry have gained the support of men who not only have great financial resources but who are also proved organizers and industrial leaders.

Production Incentives

WAGE difficulties often arise because of a difference in fundamental viewpoint between management and men. Management naturally views wages as a means of getting men to perform certain functions as competently as possible. An employee, on the other hand, views wages not only as a reward for services rendered, but basically as a means to greater comforts, to personal pleasures, to wider opportunities or to whatever may happen to be his particular personal aim in life.

Thus the employee desires to get as much as possible for his services, while management cannot logically fulfill its function except by paying as little as is consistent with the obtaining of maximum service. Wages higher than the average might be the lowest possible if maximum service is to be generated. The actual wage level isn't of much importance in itself.

Thus the problem of management in any given case is to find the relationship between the factors of wages and service which result in the highest efficiency. Such a computation would be difficult in actual figures, although something along that line might be worked out. The problem can be approached, however, from the standpoint of logic and psychology.

No wage system should be viewed as permanently acceptable until it has been analyzed thoroughly from the standpoint of its incentive value. Some of the wage systems in use, while based on the fundamentally sound piece-work idea, are so worked out as to influence the worker to retard rather than to increase production after a certain point has been reached. Others, while never exerting a negative influence, do not embody the positive incentive values needed to procure maximum efficiency.

Different jobs and different factories are likely to require different systems or at least variations of the same general set up. But the incentive value of wage systems is due for serious study in the future, despite the thought that already has been put on that phase of wages by some industrial managers.

Our Industry Today

Outlook for July Favorable as June Totals Show Less Decline Than in Former Years—Trucks, Tires and Parts Continue to Gain

NEW YORK, July 1—Good automotive business was experienced up to the end of June, and the outlook for July is favorable. There was a slight seasonal decline in sales during the month just past, but the drop was less than in former years and far less than was expected late in May.

Several large producers in various price classes are still behind in meeting orders—a highly unusual situation for this time of year. Others have caught up, however, and are slowing down in production. The lower activity is particularly noted in those factories that are preparing to introduce new models.

Three or four new cars have been introduced recently and their reception from the public has been most cordial, a particularly striking example of the keen interest in automobiles that buyers everywhere are evidencing.

Where unsatisfactory sales conditions are reported, local influences are found to be the causes, such as the coal situation in sections of Pennsylvania and the poor state of crops in the Southwest.

Truck Sales Better

Truck sales and production are running well ahead of last year at this time. With the opening of the tourist season the automotive supplies market has experienced a quickening in almost all lines. The tire market has shown particular strength. Replacement parts and shop equipment continue to show a slight gain in almost all sections of the country.

Exports are setting records and it begins to look as if the total for the year may reach the half million mark, against 385,000 last year, which marked the peak of foreign sales for all time.

A healthier condition among car distributors and dealers is one of the notable achievements of the year in automotive lines. This is particularly noted in used car stocks, which in most sections of the country are low. Used cars moved in satisfactory volume throughout the month and new car stocks are also in good shape.

A steadying factor contributing to the general prosperity of the industry has been the remarkable showing made by rural districts in most sections of the country, and coming at a time when city markets normally ease off considerably. In most sections of the country the outlook for crops is good.

Any view of the favorable factors in the automotive situation must consider the extraordinary means taken to force sales in some parts of the country. The tendency to extend the limit for completing time sales, and to reduce the initial payment, undoubtedly has brought buyers in the market who otherwise would have stayed out.

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Prices Raised Again on Tires and Tubes

Leading Manufacturers Announce Increases of from 10 to 15 Per Cent

AKRON, July 1—As predicted in AUTOMOTIVE INDUSTRIES, most of the leading rubber manufacturers put into effect today increases of about 10 to 15 per cent in prices of automobile tires and inner tubes. Ford size balloon tires are raised slightly less than other casings.

Official announcements of price revisions are made by the Goodyear Tire and Rubber Co., Miller Rubber Co. and General Tire and Rubber Co. Other companies are preparing revised lists to become effective at once.

Tube prices are raised 33⅓, marking one of the largest single revisions in the history of the industry by General, but this company's schedules have been out of line with its competitors. This is the third General tire advance within the past three months, due to the 300 per cent rise in the crude rubber market since the first of the year.

Blame British Restrictions

The British restriction act has been largely blamed for forcing up the cost of raw material, but the unexpected heavy production of tires this year also has helped to deplete stocks and create a temporary shortage of rubber. Spot rubber sold early this week at 90 cents a pound, compared with 17 cents last year. The market eased off below 85 cents later.

Goodyear officials express the opinion in a statement tonight that the abnormal high rubber prices will not continue indefinitely. They indicate also that the manufacturers are absorbing part of the higher cost of crude rubber, rather than passing it all on to the consumer.

W. C. Behoteguy, manager of tire sales at Goodyear, says:

"This is the third increase in tire prices which the manufacturer has been compelled to make this year because of the 300 per cent crude rubber advance, and the public is apt to conclude that tire prices are much higher than they really are. As a matter of fact, prices at the new levels are only very slightly above what they were at this time last year. The three increases combined average less than 20 per cent in casing and 35 per cent in tubes.

"The automobile tire is one of the few commodities in general use that can be bought today at less than pre-war prices. While general commodities have increased 56 per cent since 1914, tire prices are actually 36 per cent lower.

"The best Goodyear 30 x 31½ or Ford size tire, for example, sells at just half what it did in 1914—and gives at least three times as much mileage. In other words, the car owner's dollar goes six times as far today in tire mileage as it did before the war.

"This comes in part from the fact that we have been in an unusually favorable position, due to depressed prices of crude rubber since 1920. That situation, of course, could not continue indefinitely, any more than the present abnormally high price of rubber can continue indefinitely.

May Export Figures Hit New High Level

WASHINGTON, June 30—Exports of automotive vehicles reached their highest levels for all time during the month of May, according to the monthly shipping statistics just announced by the Automotive Division of the Bureau of Foreign and Domestic Commerce. A total of 35,642 cars and trucks were shipped abroad in May from the United States and Canada, as compared with 34,735 vehicles exported during April.

The detailed figures for May were as follows:

	United States		Canada	
	No.	Value	No.	Value
Cars....	24,562	$19,411,418	4,633	$2,090,402
Trucks..	5,309	3,472,325	1,120	361,569

May production in the foreign assembly branches of American companies has not yet been announced, but it is evident that the total was in the neighborhood of 15,000, which appears to be approximately the present monthly average. If that figure accurately forecasts the volume reached by these plants, the total export trade in American made automobiles was in excess of 51,000 units. The previous record month was 51,014 units, attained during April.

"One of the outstanding features of the month's shipments is the increasing quantities of cars and trucks shipped to the United Kingdom during May, which

(*Continued on page* 37)

G. M. May Take Over Yellow Cab Control

Report Latter's Stock Will Be Increased—Officials of Both Organizations Silent

NEW YORK, July 2—Successful completion of negotiations looking to a transfer of control of the Yellow Cab Manufacturing Co. to the General Motors Corp. is reported on the highest authority as AUTOMOTIVE INDUSTRIES goes to press. John Hertz, president of the Cab company, after two days in New York, is on his way to Chicago, where an early announcement of the plan is expected.

Just previous to a meeting of directors of the Yellow Cab company in Chicago this week Mr. Hertz virtually admitted that the negotiations were under way, and it was understood that the meeting was called to prepare a plan for the deal for transmission to the stockholders, who will be asked to approve it.

No Denials Issued

Conferences were hed in Detroit and Chicago recently by representatives of the Yellow Cab Manufacturing Co. and the General Motors Corp., and although no official announcement has been made, it is persistently reported in Wall Street and La Salle Street that the purposes of these conferences were to effect a consolidation of the two concerns, neither of which has issued a denial of the reports.

General Motors has no bus or cab division, while several of its leading competitors have. By acquiring control of the Yellow Cab Manufacturing Co., it is believed that General Motors would obtain an enviable position in the bus and cab field, in which the Hertz organization is prominent.

Such control would mean also close affiliation of General Motors with the Yellow Cab Co. of New York, the Chicago Yellow Cab Co., the Omnibus Corp. and the Yellow-Drive-It-Yourself system, which are the leading outlets for the products of the Yellow Cab Manufacturing Co.

The exact method of transferring control is a matter of conjecture. Many quarters credit Mr. Hertz with controlling not more than 30 per cent of the stock of the company which he heads. Since this would make it impossible for him to deliver entire control, it is believed that General Motors is planning an exchange of stock.

It is reported that this plan would increase class B capitalization of Yellow Cab from 600,000 $10 par value shares to 1,400,000, the 800,000 additional shares to be purchased by General Motors at $20 per share, or a total of $16,000,000.

Instead of cash, this report says General Motors would give in exchange two of its divisions, General Motors Truck Co. and Northway Motor and Manufacturing Co. Holders of the existing 600,000 class B shares, it is said, would each receive one additional share of class A stock for each four class B shares held. The 6750 outstanding class A shares of $100 par value are entitled to 7 per cent cumulative dividends before dividends can be paid on B shares, which pay 21 cents monthly, or about $2.50 per year.

Wall Street gives credence to this reported exchange plan.

RHODE ISLAND ORDERS MOTORS TO SPEED UP

PROVIDENCE, R. I., June 30—Ten or fifteen miles an hour is too slow for Rhode Island. Automobiles must travel at least 35 miles per hour on heavily traveled traffic arteries throughout the State, or get off the road, according to a new order which will be enforced by the newly created State police, of which Col. E. St. J. Chaffee is commander.

He says that roads which have cost the people millions of dollars are too expensive to be cluttered up with traffic crawling along at 10 or 15 miles per hour. If crawling is to be permitted he thinks the State will have to double the number of its roads to accommodate traffic.

Gardner Eight Cabriolet Foursome Lists at $2,245

ST. LOUIS, June 30—Shipments of the Gardner eight-in-line Foursome Cabriolet, which lists at $2,245, are now going forward to dealers and distributors.

Upholstery is mohair, harmonizing with the exterior finish of two-tone musketeer and matchlock gray Duco. The main seat is wide and roomy, and the rumble seat for two in the rear deck is upholstered in leather. The windshield frame is an aluminum casting and is designed to give maximum driving vision and minimum annoyance from glare caused by sunlight or the strong headlights of cars behind. Corner post lights are used for interior illumination, and there is a handy compartment for tools and packages just back of the main seat. A sliding plate glass window in the rear gives added ventilation and permits communication with the occupants of the rumble seat.

Equipment includes five 5.77 in. balloon tires on Disteel wheels, double-barred bumpers front and rear, spare tire cover and snubbers all around.

CANADIAN TIRES RAISED

TORONTO, ONT., June 29—Owing to rapid advances in prices of crude rubber, and in spmpathy with the recent advances in quotations in the United States, prices locally have been advanced 5 per cent on tires and 10 per cent on tubes. It is stated that manufacturing costs warrant still higher prices in Canada.

N.A.C.C. Committee Will Consider Parts

Car Manufacturers to Survey Replacement Parts Field to Regain Business

NEW YORK, July 2—Motor car manufacturers, acting through the National Automobile Chamber of Commerce, are seeking means of winning back some of the business they have lost to independent makers of replacement parts. Col. Charles Clifton, president of the chamber, has been directed to form a committee to go into the matter thoroughly.

The manufacturers have recognized for a long time that much of the replacement parts business goes to independent garages and repair shops not affiliated with the sale of any car and that independent makers of parts suitable for use in various passenger cars have done a good business for years in the replacement market, selling not only through the garages and service stations but also through jobbers to passenger car dealers as well.

May Improve Merchandising

Just what policies the committee will consider as best for the car manufacturers cannot now be forecast, but the prevailing sentiment is that the competition should be met with better merchandising methods. The N. A. C. C. members believe that only parts bought through the car factory should be used for replacement by their dealers, but it is recognized that the independents have made heavy inroads through quick service and low prices.

The manufacturers realize that by no means all of the parts made by independent factories are inferior in quality, and that quality being equal, the agency which provides the quickest service and best price will get the business. In the decision to form the parts committee the N. A. C. C. members took due cognizance of these facts.

On Competitive Basis

The tendency to call names is less marked today than it was several years ago, when "pirate" was the usual term of opprobrium for the independent parts maker. Few men in the industry now see any justification for branding with such a term any parts manufacturer who makes a standard, trade-marked product and stands behind that product with his name and reputation throughout its merchandising course.

The disposition now is to accept the situation on a purely competitive basis and through appropriate action to increase the share of the car factory in this profitable end of the business.

One manufacturer, acting independently, has just decided to absorb freight charges on replacement parts, enabling dealers to quote factory list prices on the items.

Say Firestone Ready to Grow Own Rubber

Report Liberian Negotiations Practically Concluded—May Include Public

AKRON, July 1—Confirmation of a recent story that the Firestone Tire and Rubber Co. was preparing to grow crude rubber on a large scale in Liberia is seen in a report that negotiations have practically been concluded by Harvey S. Firestone, president, for a large concession of plantation land in that country, to be accompanied by a loan of $5,000,000 to the Liberian government.

The Akron manufacturer has fought vigorously the British rubber monopoly since the restriction act went into effect three years ago, and has urged that "Americans should produce their own rubber." Firestone recently delivered a broad hint that the public would shortly be permitted to participate in a raw rubber enterprise with him, and if the Liberian report is true, this must be it.

Unfortunately for the automobile industry, Firestone's blow at the rubber monopoly will not come soon enough. With raw rubber about 85 cents a pound and tire prices going higher in a few days, the Liberian trees cannot be tapped for five years.

British Not Serious

Meanwhile the British do not seem to be taking seriously the threat of the Rubber Association of America to retaliate against the crude rubber restrictions in the Far East by dealing with the Dutch. The Manchester Guardian Commercial says in its issue of July 18:

"A couple of years ago, it will be recalled, the association was said to be taking somewhat similar steps against British planters, and nothing materialized. It is suspected that the move is being used by speculators in New York to depress rubber prices."

Firestone, it will be remembered, broke with the association over its policy regarding the crude rubber restrictions, and they have since been proceeding along different lines looking for remedies.

The Manchester Weekly, just quoted, intimates that a turn in the price of rubber may be near, due to a seasonal slackening of demand in America and the approaching increase in permitted releases by the growers.

LAUDS SAFETY DEVICES

ATLANTIC CITY, June 29—Manufacturers of automobiles were paid high tribute for their part in promoting the safety cause here today by George M. Graham of Cleveland, chairman of the traffic and safety committee of the National Automobile Chamber of Commerce, in an address at the annual meeting of the American Automobile Association. He said that through "unremitting effort" the manufacturers had contributed to the safety campaign by improvement of machinery such as brakes, steering assemblies, adequate lighting and the giving of uninterrupted vision to the driver.

Facts and figures were presented by Mr. Graham to show that the country is making steady and encouraging headway in the reduction of accidents and fatalities on the highways.

Hudson Sales in June Break Previous Records

DETROIT, June 30—Hudson-Essex sales, which will be between 26,000 and 27,000 for June, will break all previous records, and will be the best month in the history of the company, according to word given out at the factory. The present sales and orders on hand will exceed those for May by about 2500.

Ninety per cent of the orders are for inclosed cars, with the demand being even throughout the entire country. The sales of both cars are running about even. The new Hudson brougham has met with a countrywide reception, factory officials said, that will insure this model meeting with good demand for some time.

Plans now under way at the factory call for the output being increased from 1200 Hudson-Essex cars, the daily output now, to 2000 by the end of the month. Despite the increased demand, no unusual delay has been experienced in meeting deliveries. With the increased output it is hoped to make deliveries within an unusually short time.

Marmon Earns $1,178,198 During First Six Months

INDIANAPOLIS, June 29—Earnings for the Nordyke & Marmon Co. for the first six months, after taxes, depreciation and contingency allowances, amounted to $1,178,198. G. M. Williams, president, announces that sales for this period have been very satisfactory and that the retail selling organization has been expanded 20 per cent this year.

Shipments of Marmon cars have been almost 100 per cent ahead of the similar period last year. By reason of the inventory reductions the latter part of 1924 it has been possible to revolve the inventory at the rate of 10.28 times per year.

Mr. Williams sees the future as encouraging, with prospects that late summer and fall business will equal the increase shown in the first six months.

COMPLETE CASTING PLANT

READING, PA., July 1—General Die Casting Co., recently incorporated here, has completed the erection of a new building which forms a portion of three units, giving the plant, when complete, a floor space of about 3000 sq. ft. F. C. Morrison, vice-president and manager, was manager for 12 years of the die casting division of the Light Manufacturing and Foundry Co., Pottstown.

Graham Brothers in Larger Quarters

New Plant in Detroit Laid Out for Direct Flow of Units and Parts

DETROIT, June 30—Graham Brothers has again increased its Detroit factory space and now has quarters under one roof, 400 ft. by 600 ft., in a steel and concrete building erected by Dodge Brothers in 1917 as an ordnance plant for manufacture of recoil mechanism for French heavy guns.

The new plant has been laid out for direct flow of materials, units and parts from receiving docks through departments and stockrooms to the assembly line without any retracing or unnecessary handling.

Materials from railroad cars are unloaded on covered platforms and conveyed down an aisle in the main building to stockrooms or departments.

At the extreme end of this aisle and at right angles to it is the frame assembly line. While the frame travels 100 ft., wrong side up, on a conveyor, the necessary brackets are hot riveted in place, and the springs and front and rear axles are attached.

The frame is then taken by a small overhead conveyor, turned right side up, carried through an enamel spray and then through an enamel oven. As the frame emerges from the oven, it is picked up by another overhead conveyor, which takes it around a right angle turn and places it upon the final assembly conveyor.

The first Graham Brothers plant in Detroit, in 1921, had 13,000 sq. ft. In 1922 this was increased to 27,000 and in 1923 to 40,000. In 1923 they moved into a plant of 60,000 sq. ft. Soon still more space was required. First 36,000 then 50,000 sq. ft. were added, and on June 1, another move gave them 250,000 sq. ft.

Estimate June Output as New Monthly Record

DETROIT, June 29—Preliminary estimates for June automobile production, gathered from shipments made by factories, place it at slightly less than 400,000, a new record for June. The best past production mark was made in June, 1923, when 386,539 cars and trucks were manufactured in the United States and Canada. Of this number about 12,000 were produced in Canada.

It is expected that July production will be below that of June, but that August sales and production will show a distinct increase.

Decreased June production was caused by slackening of output by factories given to yearly models. These plants are not expected to resume full manufacturing schedules until after their models have been presented.

OPEN BIDS FOR EIGHT AIR MAIL CONTRACTS

WASHINGTON, June 30—Bids for eight air mail route contracts have been announced by Postmaster General New under the legislation enacted at the last session of Congress. The routes are as follows:

Boston to New York, via Hartford, Conn.; Minneapolis and St. Paul, via La Crosse, to Chicago; Birmingham, Ala., to Chicago, via Nashville, Louisville and Indianapolis; St. Louis to Chicago, via Springfield, Ill.; Fort Worth and Dallas to Chicago, via Oklahoma City, Wichita, Kan., Kansas City and St. Louis, Mo., and Moline, Ill.; Los Angeles to Salt Lake, via Las Vegas, N. M.; Pasco, Wash., to Elka, Nev., via Boise, Idaho; Los Angeles to Seattle, via Bakersfield, Fresno, San Francisco, Sacramento, Cal., and Ashland and Portland, Ore.

The postage rate will be 10 cents an ounce on each of the contract routes not over 1000 miles in length, and 15 cents up to 1500 miles in length, with 5 cents adtional for each zone traveled on the transcontinental Government-operated route.

Cleveland Sport Sedan Introduced at $1,725

CLEVELAND, June 30—A new sport sedan mounted on the Cleveland "43" chassis and listing at $1,725 has just been added to the line by the Cleveland Automobile Co. The latest 5-passenger closed model is patterned along the victoria type lines, having smart oval windows with aluminum top bows built into the rear upper section and provided with an aluminum trunk rack and bars at the rear. The design of the Fisher body gives the car a long, low hung appearance.

Foch blue Duco, with the beading in contrasting color, black finish above the belt and black fenders and running gear, together with the nickel plated radiator shell carrying a motor meter and bar, give the new model a very distinctive effect.

Gray mohair of special shade constitutes the upholstery and color scheme. Unusual comfort is provided in the interior by making the seats wide and high backed and providing an arm rest on either side of the rear seat.

Features of body equipment are: Fisher "V-V" windshield and the rectangular windows operated by crank regulators, instrument board finished in Circassian walnut, silk curtain for rear windows and dome light controlled by a push button. Additional items as standard equipment include automatic windshield cleaner, sun visor, rear view mirror and cowl lights.

A. E. A. and M. A. M. A. Consolidation Discussed

Committees Working on Consolidation Plans—May Ask Other Associations to Join—Selling Is Keynote of Summer Convention

COLORADO SPRINGS, June 26—Consolidation of the Motor and Accessory Manufacturers Association and the Automotive Equipment Association, as a step toward elimination of duplication of effort and expense and to effect one large, strong organization in the car equipment field was a major topic of discussion at the tenth anniversary convention of the A. E. A., held here this week at the Broadmoor Hotel.

President William T. Morris of the American Chain Co., mentioned the project briefly earlier in the week, but it was not put before the delegates for an expression of sentiment until the closing session.

That the project has made more than a favorable impression on the members of the manufacturer-jobber organization was indicated not only in the convention floor discussion, but in the informal discussions in the rooms and corridors of the hotel throughout the week.

At the closing session President Morris explained that committees from both organizations had held several preliminary meetings, but they had only power to talk and prepare a plan that would be acceptable to both memberships.

Both Have Strength

It was pointed out that both associations at the present time possess strength in certain departments that would give a merged association particular facilities for wide service to its membership, and in addition to this would wield for it a commanding influence in the equipment field, in legislative matters and in its contact with the car manufacturers through their association.

It was understood during the floor discussion that if the consolidation is effected both associations will enter on an equal footing and that the jobber members of the A. E. A., although in the majority, will have equal representation with the manufacturers on the boards and committees and on the convention floor. This is the plan that is now in operation in the Automotive Equipment Association.

The committee of the A. E. A. was voted power to proceed with the arrangements and report at the November meeting in Chicago.

Committees to Confer

The committees working on the consolidation plans are composed of the following members: for the Motor & Accessory Manufacturers Association, president E. P. Chalfant, Gill Manufacturing Co., New York; C. E. Thompson, Thompson Products Co., Cleveland; Earl V. Hennecke, Moto-Meter Co., Long Island City, and M. B. Ericson, Biflex Manufacturing Co., Waukegan, Ill. For the Automotive Equipment Association, president William T. Morris, American Chain Co., Bridgeport; vice-president N. F. Ozburn, Ozburn-Abston Co., Memphis; F. B. Caswell, Champion Spark Plug Co., Toledo, and Arthur Storz, Storz-Western Auto Supply Co., Omaha.

There are rumors that at least one other automotive association, possibly more, will be asked to join in the consolidation, but up to the present time the committees are concerning themselves entirely with the A. E. A. and the M. A. M. A.

Approve Administration

The A. E. A., at this meeting, passed a resolution approving the program of President Coolidge, Secretary Mellon and the administration in its program of lowering taxes, especially the income and surtaxes. Copies of the resolution will be sent to the president and secretary of the treasury. It also concurred in the N. A. C. C. resolution requesting the lifting of the present excise tax on automotive products, characterizing the tax as discriminatory and unfair especially since taxes on other forms of transportation have been removed. Likewise, the convention formally approved the efforts of the Department of Commerce toward simplifying and standardizing tire and rim sizes.

May Combine Shows

President Morris announced that the motor car contact committee had met the car manufacturers in Detroit and were endeavoring to complete negotiations for holding the next service maintenance convention in Chicago in conjunction with the A. E. A. equipment show. He announced that the Motor and Accessory Manufacturers Association was cooperating in this project.

The merchandising program was a broad one centered around the presentation of the Harvard bureau survey of the cost of doing business in the wholesale automotive field by Dr. Melvin T. Copeland, Director of the Harvard Bureau of Business Research.

The survey showed a slight decrease in the net profits in 1924 due principally to sales expense.

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Motor Stocks Rise on Merger Rumors

Slight Quickening Evident in Week's Business Worthy of Noting

NEW YORK, July 1—It is not easy to determine from an examination of the fundamentals of finance, commerce and industry which of the favorable and which of the unfavorable factors is predominant in the speculative market. One may accept the pronounced ease of credit rates as the sustaining force of prices, but the very ease of credit in itself proves the relatively small commercial demand and thereby refutes its own argument.

Business does not borrow money because rates are low, but because it can turn over goods at a profit, so the low rate would seem to indicate that business, as a whole, sees no immediate demand for goods at a profit which would warrant using credit even at the prevailing rates.

Commercial Loans Gain

In recent weeks there has been a definite indication of a slight quickening of business, even if the movement has been confined to relatively few lines. The reports of the Federal Reserve Banks, as well as of the member banks, show that commercial loans, after remaining practically stationary for several months, have begun to gain. The movement has been small and by no means uniform, but it has continued sufficiently long to indicate that business is beginning to take counsel of its courage rather than of its fears. This is the way business expansion normally begins, and the movement is sufficiently significant to be worthy of noting.

Some Optimists Changed

This may well explain the optimistic sentiment, strengthening at the end of the mid-year and reflected in a gradually advancing level of stock prices. During the first quarter industry generally operated at a high rate, and in some instances leaders allowed their hopes to obscure their judgment. When declining operations began with the second quarter, and an already rather narrow margin of profit was still further reduced by price cutting and competition, many of these optimists became pessimists. There is no more reason for this latter view than for the former, and this is true especially of the automotive industry. Here the unexpectedly large and sustained demand for cars has exceeded the fondest hopes of many of the shrewdest judges of conditions. The demand has been diversified, and practically all grades of cars, as well as all types of cars, have been sought by purchasers.

This is the situation which has found reflection in the trading in motor stocks

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Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, July 1.—Seasonal dullness was apparent in financial and commodity markets last week. Both in trade and industry, however, activity is at materially higher levels than a year ago.

Perhaps the most noticeable recent development in the business situation is the advance in call loan rates. On Monday of this week the quotation rose to 6 per cent, which is the highest point reached since the end of 1923. The advance is attributed to the withdrawal of funds for mid-year interest and dividend requirements.

Commodity prices in general were distinctly firmer last week. Stock quotations moved irregularly, with little net change in the averages. Weather conditions were generally favorable, although rain is still badly needed in some parts of the Southwest.

Production in basic industries in May, according to the index of the Federal Reserve Board, was 6 per cent smaller than in the preceding month. Declines took place in the production of iron and steel, woolen textiles, copper, sole leather, newsprint and automobiles, and in cotton consumption and building contracts. The volume of wholesale trade was about the same as in April, and about 3 per cent greater than a year earlier. Wholesale prices continued to decline. Sales at retail were smaller than in April, but somewhat larger than in May last year.

Production of bituminous coal in the week ended June 13 was the largest since March, amounting to 8,616,000 tons, as compared with 8,372,000 tons in the preceding week and 7,385,000 a year earlier.

Business failures reported to Bradstreet's for the week ended June 25 numbered 303, as against 341 in the preceding week and 340 in the corresponding period last year.

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended June 24 were 10.1 per cent less than the total for the week before, but 16.5 per cent above that of a year ago.

Fisher's index of wholesale commodity prices stood at 159.5 last week, comparing with 158 in the preceding week and 156.9 a fortnight earlier.

Earning assets of Federal Reserve banks increased $27,300,000 during the week ended June 24. Discounts gained $13,500,000 and holdings of Government securities $18,200,000, while open market purchases declined $4,400,000.

Hardy Resigns from Olds Motor Works

Will Be Succeeded by Reuter—Became Connected with Industry in 1902

LANSING, July 1 — Announcement was made today that A. B. C. Hardy, president of the Olds Motor Works, has sent his resignation to the New York office of the General Motors Corp., asking to be relieved of his duties July 1. From the New York office comes the statement that I. J. Reuter, general manager of the Olds division of General Motors, has been elected to the presidency.

The Olds division is the manufacturing unit and the Olds Motor Works the selling organization. It has been General Motors' practice to have the same men as general managers and presidents of the plants and sales organizations.

Will Stay in Lansing

Mr. Hardy has no plans for the future other than that he will stay in Lansing and rest for some months. He started in the carriage business in 1892 and until 1900 was with the Wolverine Carriage Co. of Davison, Mich.; the Diamond Buggy Co., Flint, and the Durant-Dort Buggy Co., also of Flint.

In 1901 he made an exhaustive study of the automotive industry and the following year organized the Flint Automobile Co., the first concern of its kind in the city. Two years later he returned to the carriage business, remaining in that field until 1909 when General Motors called him to Detroit and placed him in charge of the Welch-Detroit Motor Co. In 1912 he organized the Little Motor Car Co. of Flint, which was later merged with the Mason Motor Co. and the Chevrolet Motor Co., and he became vice-president of the Chevrolet firm.

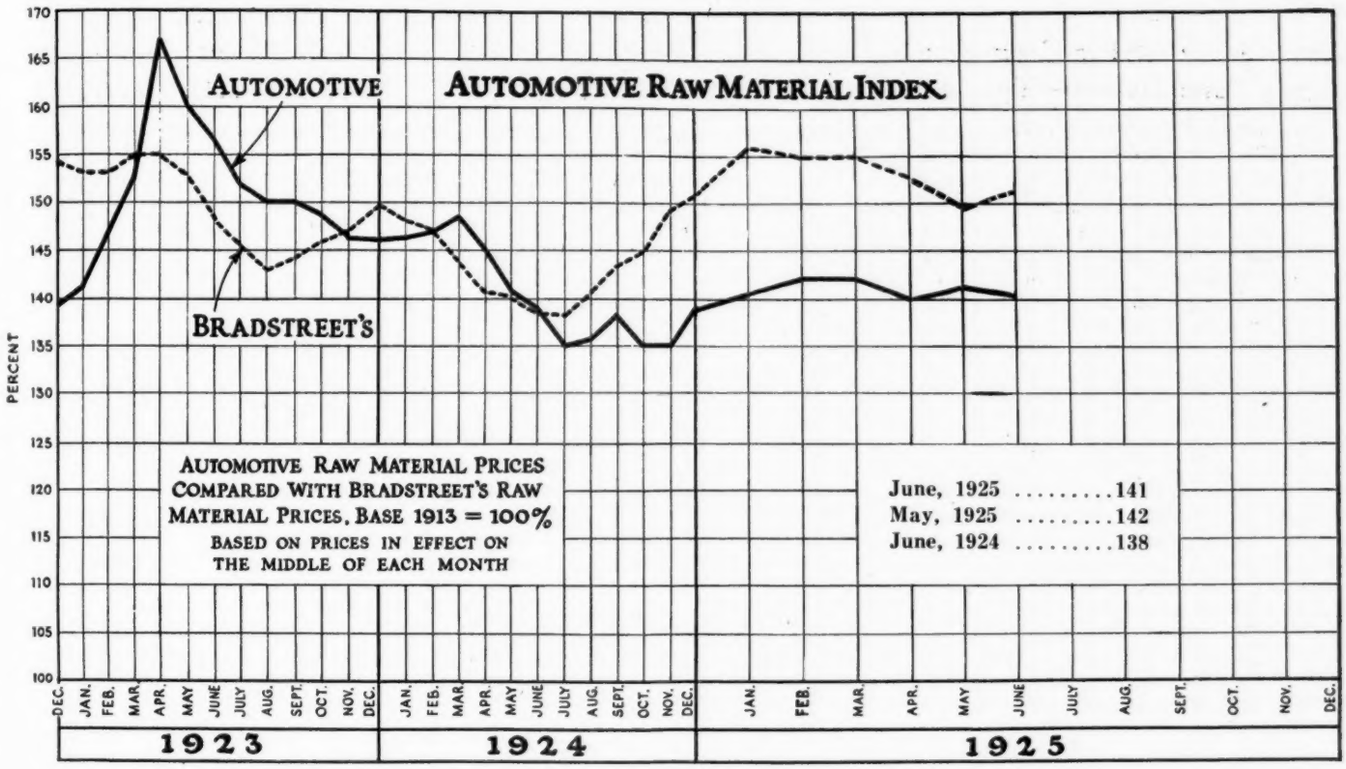
He was first assistant to the president of General Motors from 1918 until 1920 and in 1921 was made head of the Olds Motor Works.

CONTINENTAL DIVIDEND

DETROIT, July 1—At the regular meeting of the board of directors of Continental Motors Corp. the quarterly dividend of 80 cents per share was declared payable July 30 to the stockholders of record July 15. With this dividend the company will have paid to stockholders in 1925 the sum of $1,056,507.

In discussing prospects for business for the coming quarter, Ross W. Judson, president, said: "Production and sales are more than holding their own and indications point to a successful quarter. Our customers are maintaining their schedules and it is gratifying to see the way our business in the industrial division is increasing. Both our Muskegon and Detroit plants are operating nearly to capacity, which is rather unusual at this time of the year."

Prices Show Slight Decrease



Motor Stocks Rise on Rumors of Merger

(*Continued from page* 32)

during the past week. If advances in individual issues have been accompanied by unofficial reports of a favorable character, we must accept it as the natural corollary of speculation. These reports have centered around the acquisition of various other corporations by General Motors. Semi-official announcement of conversations which might result in the acquisition of the Yellow Cab Manufacturing Co. was the first of these reports to reach the financial district. The immediate result was a buying movement which carried the stocks of the companies directly involved to new high levels. Later it was reported that General Motors was negotiating for the control of the Pierce-Arrow Motor Car Co., the ostensible reason for the acquisition being the bus business of the latter company. It would seem a more logical procedure for Pierce-Arrow to incorporate its bus business into a separate organization in which General Motors might obtain control. Speculation, however, does not always follow logic. Elsewhere in this group advancing prices were due, as in the case of Moon Motors and Packard, to a known large demand for their products.

In the tire and rubber stocks first place was held by United States Rubber, which sold at the highest level since June, 1923. The movement was accompanied by a report that under an old contract with two plantations in the Dutch East Indies, the company has become possessed of a large amount of crude rubber, which it expects to sell in the domestic market at a substantial profit. Fisk Rubber and Lee Tire and Rubber advanced partly in sympathy with the leader of the group and partly on reports that both companies have ample supplies of crude rubber at low prices to meet their requirements of the year. Save for a sensational one hour advance and an equally sharp decline immediately, due to an erroneous report of earnings by Motor Wheel stock, the accessories group was without special feature.

That there should have been some shortage of call money just prior to the mid-year settlement date, with a resultant sharp advance in rates for this class of accommodation, was easily understandable. That time money for all classes of accommodation was unchanged testified to the fundamental ease of the credit situation. Interest and dividend disbursements of $470,000,000 do not spell depression, but establish a new high record for such disbursements in the history of this country and testify eloquently to the fundamental well-being of our people as a whole.—H. H. S.

N. A. C. C. BOARD MEETING

NEW YORK, July 2—The next meeting of the National Automobile Chamber of Commerce board of directors will be held in Buffalo, July 23. All the matters of major importance were covered at the June gathering, and it is unlikely that there will be more than questions of details taken up at Buffalo.

Ford Completes Erection of Dirigible Mooring Mast

DETROIT, July 1—Henry Ford's purpose to make Detroit a world center of aviation was advanced a step with the completion of the 210-ft. dirigible mooring mast at the Ford airport this week.

Located in the center of 200 acres at Dearborn, the $250,000 mooring tower represents a decided advance in both engineering and mechanical principles. The mast, which is 45 feet taller than the one at Lakehurst, N. J., was completed in 30 per cent less time, having most of the steel employed in its construction fabricated in the Ford mills.

Mooring is accomplished by means of lateral couplings extending out from the landing platform on the top of the tower and in the event of a gale of greater velocity than 60 m.p.h. threatening the safety of the airship while moored to the mast, the attachments will automatically let the dirigible loose. Electric current for operating the six-passenger elevator and the hoists for lowering the airship to the ground when required comes from the Ford River Rouge plant, while the water required for servicing the ship is piped for a considerable distance and held in a 50,000 gal. underground reservoir. All mechanism in the mast can be controlled from either the platform at the top or from the bottom of the mast.

Within a few days the "Shenandoah" is expected to arrive for trials at the mast, while it is rumored that a rigid airship of the latest and most modern type will be built within the coming year for the private use of the Ford family.

Steel Mills Depend on Industry's Orders

Compete for Orders from Car and Parts Makers—Slight Activity This Week

NEW YORK, July 1—Automotive consumption, usually the steel industry's "gravy," is all that it lives on just now. This holds not only true of the steel and steel products that are bought by motor car and parts manufacturers, but also of tool steels which would be very much neglected were it not for the constant purchases of machine tools by the automotive industries.

Fourth of July week is always an off-period, both in production as well as market activity, and the usual reports of this or that mill, among them some sheet-rolling units, shutting down for a few days' repairs were heard. While prices for many descriptions of steel continue flexible because of a continuance of most intensive competition for even relatively light orders, the extent to which prices are shaved has become very narrow. A dollar a ton below the other fellow's price is considered quite a concession these days.

Strip Market Unsteady

The cold-rolled strip steel market shows the widest discrepancies. Some Pittsburgh district mills' sales representatives profess to be unwilling to consider third quarter business at below 3.75c. They have been booking quite a little business during the closing days of June at $5 a ton below that level, and certain Ohio strip mills are reported to have gone even below 3.50c. The 2.20c. base for wide and 2.40c. for narrow, hot-rolled strips has also undergone some shading at the hands of the more eager sellers, "especially attractive specifications" being the convenient explanation for such concessions.

Sheet Sales Firmer

Full-finished automobile body sheets at 4.25c., Pittsburgh base, appear to be holding their own fairly well, as compared with ordinary sheets, but here too all sorts of inducements are said to have been granted to buyers who are not too particular about quality. Sheet bar sales at $33, a reduction of $2 from the recently prevailing level, are rumored. Cold-finished screw stock holds steady at 2.60c., Pittsburgh, and finishers report automotive commitments better than expected.

Pig Iron—Automotive foundries appear to have contracted for all of the iron they will melt in July and August, and some are protected beyond that period. The market seems to be growing a shade firmer, but very slowly so.

Aluminum—Continental European reports emphasize the growing aluminum demand for automotive consumption, the Cologne "Gazette," however, remarking that this is offset by the free supply of the Norwegian works, now "almost wholly Americanized." France, which is also slightly interested in the Norwegian aluminum industry, can supply her home needs from home production. The Germans are puzzled why their imports in March were 50 per cent greater than those in January, "mostly Norwegian-American" metal, when their domestic production is reported to have been greatly increased by the expansion of the Inn plant's output. All of which tends to show that the world aluminum situation is well regulated, and that our sole domestic producer is in undisputed control of the home market.

Copper—Automotive demand for copper and brass products continues heavy. The market, following a reaction on the heel of its recent recovery, is quiet.

Tin—A good deal of tin has been bought in London for American account at near the year's high, presumably because of anxiety lest the tin market imitate the skyrocket tactics of rubber.

Lead—Demand is normal at the lower levels now in vogue.

Zinc—Quite steady.

Franklin Reports Increase During First Six Months

SYRACUSE, June 30—A steady increase in business during the first six months of the year is reported by officials of the Franklin Automobile Co. It is stated that 42 dealers took more cars during the first five and one-half months of this year than were taken altogether by these dealers during 1924.

Since the formation of Franklin's export department with offices in New York the export business has shown a marked increase, the first five months of the year representing a gain of 12½ per cent over the same period a year ago.

Franklin dealers throughout the country will display a line of sport open models during the month of July in conjunction with extensive advertising and publicity plans, serving to focus attention on the de Causse achievements in sport car design.

The company's production, it is said, is wholly absorbed by orders on the books which will extend, according to present indications, until September.

DECISION ON BAY STATE BUSES

BOSTON, June 29—In declaring buses operated on the highways of Massachusetts without city or town licenses outlaws, and thereby nuisances, and in granting the New York, New Haven & Hartford Railroad's petition for an injunction against Fred A. Diester, the State Supreme Court has settled one phase of a controversy that has been going on for more than a year.

This decision has an important bearing upon motor bus operation in the Bay State and on the sale of buses and coaches. Several lines have been operating similar to the one owned by Mr. Diester, and now they will either have to stop or be subject to criminal prosecution.

More Crude Rubber Imported This Year

Figures for First Five Months Show Substantial Increase Over 1924 Purchases

WASHINGTON, July 1—Substantial increases in the quantity and value of crude rubber imported by the United States during May, 1925, over May, 1924, is shown in a statement just issued here by the Bureau of Foreign and Domestic Commerce.

It is shown that the total value of 36,932 long tons of crude rubber and liquid latex imported May last was $30,311,754 as compared with 27,753 long tons imported in May, 1924, which was only worth $14,304,261.

The total value of crude rubber imported by the United States during the five months ending May 31, 1925, is given at $121,417,490 for 160,147 long tons as compared with $76,185,237 paid during the first five months ending May 31, 1924, for 139,871 long tons.

During May, 1925, the Straits Settlements furnished 40,157,496 pounds or nearly half of the 82,436,180 pounds imported while the United Kingdom was second, furnishing 17,684,573 pounds. Java and Madura was third, furnishing 8,592,170 pounds.

Chrysler Canadian Sales Surpass Former Years

WINDSOR, CANADA, June 29—Sales of the Maxwell and lately the Chrysler four, and the Chrysler six in Canada for the first six months of 1925 will more than surpass the total sales for 1924 or 1923, John D. Mansfield, president and general manager of Chrysler Motor Co., Ltd., of Canada, said today. The increase is expected to be maintained in the next six months.

Ontario and Quebec are the proviences where the heaviest buying has been taking place. In the agricultural districts of the West, the outlook for the next three months is good. With satisfactory crops reported in the wheat sections and with indication of the farmers getting a good price for their goods, the sales of automobiles are expected to show a corresponding jump.

In the far west the conditions, according to Mr. Mansfield, are favorable. Reports received from Chrysler dealers and distributors indicate that that part of the country is in a healthy business condition.

OLYMPIA SHOW DISPLAYS

LONDON, ENGLAND, June 16 (*by mail*)—The preliminary list of makers that will exhibit at the Olympia show to be held here Oct. 8 to 17 was announced today. The number of car displays is reduced to 112 from the 121 total of last year. More accessories will be shown, however, than in any previous shows.

Men of the Industry and What They Are Doing

New Sewell Branch

Walter T. Sewell, treasurer of the Sewell Cushion Wheel Co., has taken over the Detroit branch of the company and will handle the distribution in Michigan. The name of the new firm will be Walter T. Sewell. Associated with him is Fred E. Boylan, who has been connected with the Sewell organization for the past ten years. They have also taken over the agency for Dunlop solid and cushion tires.

Callanan Resigns

E. A. Callanan has resigned as general sales manager of the Rollin Motor Car Co., and the Cleveland Tractor Co. His successor has not been announced. During the war he was in charge of the receiving station at the Dayton flying field. He was at one time with Willys-Overland in Toledo and later was interested in distributing firms in several cities.

Buck Succeeds Johnston

W. M. Chamberlain, director of sales development of the Oakland Motor Car Co., has appointed M. L. Buck as field instructor, succeeding G. A. Johnston, who becomes retail sales manager of the Matheson-Oakland Co., Grand Rapids. Previous to his Oakland connection, Mr. Buck was with Dodge Brothers for six years.

Litchfield Celebrates Service

P. W. Litchfield will have completed 25 years of service with the Goodyear Tire and Rubber Co. July 15. He is vice-president and general manager. He is credited with pioneering the straight side tire, the first successful cord tire, the first pneumatic truck tire and other improvements.

MacQueen Handles Carriers

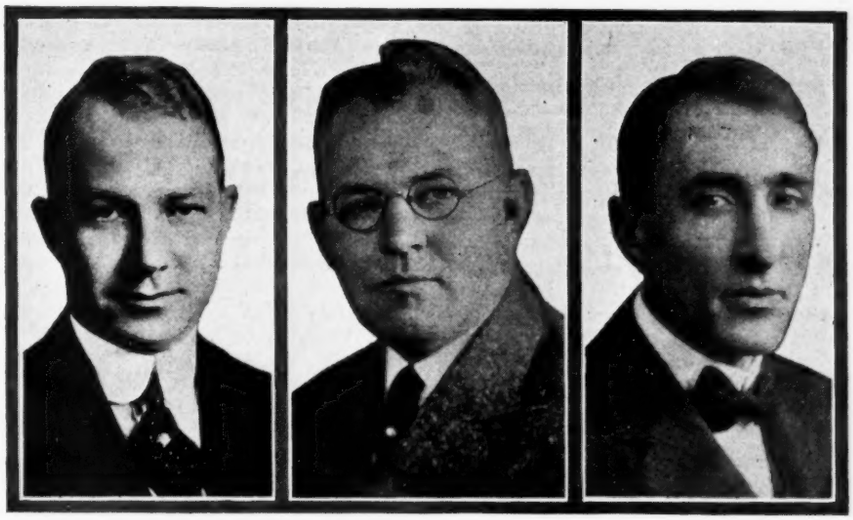
K. H. MacQueen has been appointed head of the jobber sales section of the Ireland & Matthews Manufacturing Co., dealing at this time with the establishment of national distribution of the IMCO All Steel line of automobile luggage carriers.

Fecheimer Organizes Company

S. M. Fecheimer, former manager of advertising and publicity for the Truscon Steel Co., until he organized the Industrial Advertising Co., is president of the recently incorporated Fecheimer, Frank and Spedden, Inc., advertising firm in Detroit.

Dennis Heads Service Sales

E. A. Dennis has been recently announced as sales manager of Service Motors, Inc. Previous to his joining the Service staff three years ago he was with the Ford Motor Co. During the war he served as an inspector of motor transport.



Officials of the Willys-Overland Co., who were recently promoted. Left to right, A. B. Qualy, former secretary to the president, now secretary of the company; L. A. Miller, until recently secretary and treasurer, now first vice-president; H. J. Leonard, formerly general manager of the Stephens Motor Car Co., who has been made vice-president

Buys Seamless Tube Control

J. W. Hubbard of Pittsburgh has purchased a controlling interest in the Detroit Seamless Steel Tube Co., and has been elected chairman of the board of directors. C. H. Hobbs, former vice-president, becomes general manager.

Briggs with Pontiac Concern

D. C. Briggs, former production manager of the Detroit Steel Products Co., has become associated with the American Forging and Socket Co., Pontiac, as general superintendent in charge of manufacturing activities.

Cole and Salisbury Abroad

R. S. Cole, director of exports for the Chevrolet Motor Co., and C. E. Salisbury, service manager, have left for a two months' trip that will include England and the larger Continental nations.

Chandler Goes to Memphis

A. B. Chandler has been appointed sales manager of the Western Electric distributing branch in Memphis, succeeding E. P. McGrath who has been transferred to the New York branch.

May Named Sales Director

Harold G. May has been appointed general sales manager of Berry Bros., Inc., varnish manufacturer. He will have complete charge of sales, domestic and foreign.

Dodge Elected Director

Horace E. Dodge, Jr., has been elected a member of the board of the Security Trust Co., Detroit. He was recently elected a director of the Merchants National Bank.

Smith Made Sales Manager

Lon R. Smith has been appointed sales manager of the Type 20 headlamp division of the Edmunds and Jones Corp. He previously handled field sales for this product.

Baker with Chicago Firm

L. M. Baker, formerly with the Bassick Manufacturing Co., is now Michigan representative of the Chicago Forging and Manufacturing Co.

Finletter Fisher Director

T. K. Finletter has been elected a director of the Fisher Body Corp., to succeed C. F. Reavis, Jr. Other directors were reelected.

ADD CHEVROLET SCHOOLS

DETROIT, June 30—Three more units have been added to the Chevrolet chain of service schools, C. B. Baldwin, director of Chevrolet parts and service departments announced today. They are located at Portland, Dallas and Denver.

With the establishment of the above schools, the Chevrolet system now numbers ten. The original seven are located at Flint, Tarrytown, N. Y., Buffalo, Norwood, St. Louis, Janesville, Wis., and Oakland, Cal. Students to the schools, Mr. Baldwin said come from the service department of the 3400 direct dealers and the associate dealers. The course, an intensive one, lasts a week and is attended mainly by shop foremen although subordinate mechanics may attend.

Executives Promoted in G. M. Export Corp.

Haskell Succeeded by Rumely—Dreibelbis Advanced—Tipper to Be Sales Manager

NEW YORK, June 30—J. D. Mooney, president of General Motors Export Co., announces that A. L. Haskell, director, vice-president and general manager of the company, has resigned to engage in business enterprises that will permit residing more permanently in New York.

Leo M. Rumely, vice-president and regional director of Australasia, has been appointed to succeed Mr. Haskell. Due to an error, it was stated in last week's issue of *Automotive Industries* that Mr. Mooney is being succeeded by Mr. Rumely, instead of the change as outlined above. Mr. Rumely has spent all but two years in the export field since he became export sales manager for the M. Rumely Co., later the Advance-Rumely Co., of La Porte, Ind. Much of his time was spent in extended trips to all parts of the world, during which he had first hand experience in developing overseas trade.

Rumely's Experience Varied

After his return from Russia in 1918 he became sales manager of the Vulcan Implement Factories of Evansville, Ind., and later retail sales manager of the truck division of the Reo Motor Car Co. of Chicago. He joined the General Motors Export Company as manager of the Samson Tractor Division in 1920 and in June, 1922, became manager of the European sales division, later spending several months on the Continent. In April, 1923, he took over the Sydney, Australia, office and was appointed vice-president and regional director of Australia.

Dreibelbis Now Director

J. H. Dreibelbis, who has been general sales manager, has been elected a director and vice-president. He will serve as executive assistant to Mr. Mooney.

Harry Tipper, secretary of the *Chilton Class Journal Co.*, will become general sales manager of the General Motors Export Co. July 15. He has been engaged in sales and marketing work for the last 15 years, following his early work in engineering and shop management in England. For several years he was connected with sales engineering work in the marketing of mining machinery, and in 1908 joined the Texas Co., as sales engineer. Later he became advertising manager and member of the sales committee of that organization, remaining there until 1907 when he was made manager of *The Automobile* (now *Automotive Industries*).

As secretary of the *Chilton Class Journal Co.*, his work has consisted largely of market analysis in connection with automotive products, of merchandising methods and supervision of sales. Besides his active sales work, Mr. Tipper has been prominent in advertising circles for many years, having been president at different times of the Association of National Advertisers, the Advertising Club of New York, the Technical Publicity Association and the New York Business Publishers Association. He is the author of a number of standard books on marketing including "The New Business," "Advertising Campaigns" and "Advertising, Its Principles and Practice," the latter of which he is co-author. He has been widely known as a writer on industrial relations and is a member of the Society of Automotive Engineers.

A. A. A. Urges Motor Taxes Be Used Only for Roads

ATLANTIC CITY, N. J., June 30—Opposition to use of motor vehicle taxes for other than road building purposes and to compulsory liability insurance for motor vehicles not used for hire was expressed in resolutions adopted here today by the American Automobile Association.

Other resolutions assured support to the national conference on street and highway safety, urged complete reciprocity between all States in passenger car registration and favored States adoption of a uniform certificate of title law to prevent theft of automobiles. The association asked that the Federal road aid policy be continued.

Thomas P. Henry of Detroit, president of the association, suggested that a cup be awarded in rotation each year to those cities that make the best record in accident reduction, the details of the award to be worked out in conjunction with the Hoover conference. This suggestion was adopted.

Mr. Henry was reelected for a third term.

MOHAWK RUBBER DIVIDEND

AKRON, June 30—In announcing the payment of accrued dividends on the company's 7 per cent preferred stock, R. E. Bloch, treasurer of the Mohawk Rubber Co., stated that business for the first five months of this year has shown an 85 per cent increase over the same period last year.

Bus Men in Revolt at A. A. A. Meeting

National Association Declares Manufacturers Would Control Operators' Activities

NEW YORK, July 2—The automobile industry's hope for a powerful and unified national organization of truck and bus operators, that would be able to function effectively on such matters of common interest as taxation and highways, received a setback at the meeting of the American Automobile Association which just ended at Atlantic City.

A virtual secession took place there of a group of truck and bus men, mainly presidents of local organizations, who had until then been active in the truck and bus division of the A. A. A., which was supported by the National Automobile Chamber of Commerce. It was the avowed intention of these men, headed by Ralph W. Sanborn of Cleveland and George P. McCallum, president of the Michigan Transportation Association, to establish as an independent organization, the National Bus Association.

Association Recently Formed

The National Bus Association was formed two weeks ago in Chicago at a meeting in which the truck and bus division of the A. A. A. was prominent, and the burning question immediately arose as to whether it should be affiliated with the car owners body. At the Atlantic City meeting disagreement on this point came to an issue, and resulted in the secession of the executive committee of the National Bus Association.

The "independents," as they have termed themselves, have expressed resentment at what they declare to be the intention of the manufacturers to dominate the truck and bus owners' activities. The manufacturers, on the other hand, say that they are interested in cooperation on matters in which both makers and owners are concerned.

The upshot of it all is that the tendency of local associations and local owners to fight among themselves is complicated by disagreement on a national scale.

J. H. Dreibelbis *Harry Tipper* *Leo M. Rumely*

Apperson Produces New Four-Passenger Coupe

KOKOMO, IND., June 27—The Apperson Automobile Co. is now in production on a new four-passenger coupe on both its six and eight cylinder chassis. Color options of blue, maroon, gray and two-tone green are available and a choice of lacquer or varnish finish is offered at no additional cost.

A feature of the new bodies is that the back cushion is adjustable on its supporting rods for a distance of four inches to meet the varying height of occupants. Ventilating eaves over doors and rear quarter windows are standard. The new coupe lists at $2,050 on the six-cylinder chassis and at $2,450 on the eight.

STANDARD TERMS PLANNED

WASHINGTON, June 30—Standardization of a large number of technical terms in English, Spanish and Portuguese will be one of the results of the Pan American Congress of Highways at Buenos Aires in October, according to the Pan American Confederation for Highway Education. Members of the United States delegation are proceeding on the principle that future national and international communications on highway building and improvement will be greatly expedited if exact definition is given to many technical words.

May Automotive Exports Establish New High Total

(*Continued from page* 28)

ranked second in the markets of importance for passenger cars with 3660 during May as compared with 1919 in April," states the division. "Truck shipments increased from 98 in April to 1305 in May, which placed this country in the first position with regard to truck shipments. Although the exports of American passenger cars and trucks increased 2.5 per cent, production decreased approximately 3 per cent below the April figure.

"The total value of all automotive exports reached $37,451,779 during May."

Piston Friction Tests Being Made by Bureau

WASHINGTON, July 1—Measurements of piston friction are being made at the Bureau of Standards for the National Advisory Committee for Aeronautics. It is believed that by determining the factors which influence piston friction, information of value in predicting performance of aircraft engines can be obtained.

Friction has been determined by measuring the power required to "motor" the engine with the ignition and fuel supply shut off. In some tests the cylinder head was removed to eliminate "pumping losses."

If measurements are made first with all rings removed and then with all rings in place, other conditions being identical, difference in power consumed ought to be a fair measure of the friction of the rings. The tests confirmed the reasonable expectation that the friction of a piston ring is affected by the design of the piston on which the ring is used.

Exports, Imports and Reimports of the Automotive Industry for May of Current Year and Total for Eleven Months Ending May, 1925

	Month of May				Eleven Months Ending May, 1925			
	1924		1925		1924		1925	
	Number	Value	Number	Value	Number	Value	Number	Value
EXPORTS								
Automobiles, including chassis	17,104	$12,177,622	29,889	$22,910,120	158,067	$112,725,802	205,049	$156,590,657
Electric trucks and passenger cars	3	2,286	18	26,377	163	215,744	125	183,333
Motor trucks and buses except electric:								
Up to 1 ton	2,166	796,675	.....	.....	20,015	8,101,198	9,403	3,847,905
Over 1 and up to 2½ tons	508	649,241	886	1,186,874	4,371	5,708,191	6,416	8,398,873
Over 2½ tons	64	147,803	153	432.665	1,273	3,277,155	1,404	3,862,858
Total motor trucks and buses except electric	2,738	1,593,719	5,309	3,472,325	25,659	17,086,544	32,980	22,826,291
PASSENGER CARS								
Passenger cars except electric:								
Value up to $500 inclusive	5,405	1,903,763	8,542	2,916,084	51,053	18,347,070	66,226	24,065,145
Value up to $800	4,106	2,717,887	6,624	4,651,967	36,195	23,900,648	44,201	31,286.584
Value over $800 and up to $2,000	4,505	4,973,766	.....	.....	42,141	45,171,345	22,761	26,749,809
Value over $2,000	347	986,201	473	1,300,942	2,856	8,004,451	3,924	10,892,272
Total passenger cars except electric	14,363	10,581,617	24,562	19,411,418	132,245	95,423,514	171,944	133,581,033
PARTS, ETC.								
Parts, except engines and tires:								
Automobile unit assemblies (Lbs.)	24,436,867	4,750,217	27,055,354	5,271,780	275,667,680	54,666,894	196,492 810	35,036,478
Accessories and parts, replacement (Lbs.)	10,400,143	2,853,712	10,913,249	3,415,662	47,827,210	12,676,125	98,105,951	28,531,952
Automobile service appliances (n.e.s.) (Lbs.)	747,858	189,364	1,038,477	393,174	3,825,302	1,560,525	8,131,170	3,463,608
Station and warehouse motor trucks (No.)	13	9,090	43	42,207	205	120,058	240	157,052
Trailers (No.)	63	26,225	15	5,582	464	176,072	598	217,440
Airplanes	1	7,500	16	29,375	61	342,736	64	326,156
Parts of airplanes, except engines and tires (Lbs.)	26,737	46,167	10,036	6,374	291,846	155,983	123,381	118,290
BICYCLES BICYCLES, ETC.								
Bicycles and tricycles	574	16,061	592	16,964	17,184	198,473	7,208	180,261
Motorcycles	1,673	389,190	1,929	431,169	18.828	4,647,903	17,831	4,048,544
Parts except tires (Lbs.)	299,972	158,441	259,662	137,398	3,093,353	1,621,545	2,498,451	1,392,113
INTERNAL COMBUSTION ENGINES								
Stationary and portable:								
Diesel and semi-Diesel	32	17,990	35	64,771	1,440	485,413	767	449,222
Other stationary and portable:								
Not over 10 H.P.	2,364	206,066	2,133	184,718	23,671	2,134,432	26,014	2,433,855
Over 10 H.P.	192	160,904	229	199,145	2505	1,508,107	1,965	1,750,043
Automobile engines for:								
Motor trucks and buses	33	13,278	3,261	299,938	1,121	129,567	27,032	2,401,215
Passenger cars	1,468	231,437	13,524	1,521,674	24,724	3,714,549	67,053	7,926,067
Tractors	122	54,596	120	45,716	1,740	474,796	2,260	744,521
Aircraft	22	29,800	3	8,320	170	206,481	56	109,920
Accessories (Lbs.)	659,855	311,445	950,987	405,969	7,799,553	3,394,253	7,067,920	3,202,943
IMPORTS								
Automobiles and chassis (dutiable)	63	88,449	64	94,433	784	806,308	502	840,806
Other vehicles and parts for them (dutiable)	.....	81,690	.....	77,593	.....	1,437,218	.....	664,166
REIMPORTS								
Automobiles (free from duty)	33	26,221	11	6,361	367	545,479	455	664,505

July Outlook Favorable as June Shows Slight Drop

(*Continued from page* 28)

A remarkably even trend is shown in the sectional reports of conditions coming to AUTOMOTIVE INDUSTRIES from its correspondents in 30 key cities.

In the New England States sales have shown a steadier tendency than during May. The market in Boston has been especially favorable, but dealers in the outside territory do not seem to be doing quite as well as they expected. Maine is showing signs of better business. Business generally is good, and a busy season in the shoe factories is having its effect on the sales of automotive lines. Used car sales have been satisfactory, a report to the Boston police showing that dealers were actually selling more used cars than they were taking in trade. This, of course, means that used car stocks were lessened during the month just past. In accessories, parts, tires and equipment business is good to fair.

Atlantic States

The Middle Atlantic States report business in new and used cars and other automotive lines as generally active, in most sections on a higher plane than is usual for this time of year. The only really soft spot seems to be in the coal mine districts. Pittsburgh reports that probably six makes of cars are still being well sold, but in other lines the trade has either become normal for the season or below normal. No immediate improvement is looked for. Harrisburg, on the other hand, finds that motor car sales in June continued strong, with only a slight decline, if any, from the May high records. Used car stocks are low, but the market is not very active. Philadelphia reports:

New car sales have slacked up a trifle since May, but are still active and satisfactory. The volume of sales is about even with this time last year. New car stocks have been nearly cleaned out and there are comparatively few new cars in the storage warehouses at this time. Deliveries in many cases are reported slow. The demand is strong for used automobiles and the stocks are so low now, that there have been efforts to obtain used cars, in some instances, from other centers.

Western New York

In western New York and in the metropolitan district the seasonal slump in sales of new and used cars and trucks has not been so pronounced as during previous years. Stocks of both new and used cars are decidedly limited, although sufficient to meet current demand. In Rochester replacing of many factory employees on part time work is credited for a let-up in accessories sales.

General business conditions are very satisfactory at this time in the South Atlantic States. With one or two exceptions all of the leading automotive lines report gains of from 8 to 15 per cent over the corresponding period of last year, with the July outlook excellent. There is promise of a larger cotton crop, which, with no reduction in the price, will mean a substantial increase in the purchasing power of southern farmers. Money is less tight than usual, although a big majority of car sales continue to be on a time basis. Steady sales, with a slight decline from the April level, are the main features of both new and used car markets, in sharp contrast to the fluctuating conditions which existed last year.

In a generally optimistic report from Norfolk, the following qualifying statement appears:

Among some of the cheaper cars an increasing tendency is shown this month to overdue the concessions being given by competitive financing concerns.

Atlanta Territory

From the important distributing center of Atlanta comes the following report:

New car sales the past month have been about on the same basis as during May, lower priced and medium priced cars a little better than the corresponding month last year, and higher priced makes of cars showing a substantial increase.

The used car problem seems lest acute than it was as dealers have been selling an unusually large number of used cars the past month, many reporting they have comparatively little stock on hand.

Truck sales are reported fair to good, generally a little better than last season at this time, while tractor business is substantially heavier, particularly industrial sales, which are running 75 to 100 per cent better than at this time last summer.

Accessory business has continued on a fairly active basis through the month, running on about a par with June, and still showing a volume somewhat in excess of last summer. Parts business is as active as ever, with sales the first six months of the year the best they have ever been in the South for that period.

In Baltimore car sales have shown a slight decline, but there has been a slight increase in the demand for equipment and accessories. Charlotte and Columbia both report good business, while Louisville says that sales on both new and used cars increased during June. Throughout the southeast market for accessories, equipment, parts and tires is generally satisfactory.

Central Localities

Some spottiness is shown by a survey of conditions in the East North Central States. A decided improvement was felt in Ohio, Michigan and Illinois, while there was a slight falling off of sales experienced in Wisconsin and Indiana. New car sales in the Chicago territory have run ahead of any month this year, and shortages in some lines are reported. General conditions are better than they have been for some time, especially in and around Akron, where the prosperity of the large rubber companies has stimulated automotive sales. Collections are good, and money conditions are generally reported to be very easy.

The used car situation is very satisfactory with cars being moved quickly and in a volume that compares favorably with the number being taken in trade by the dealers. One of the unusual features of the cars being accepted in trade is the absence of 1924 models. Indications are that owners intend to drive last year's models for another season before trading them in.

Northwest Section

In Missouri, Minnesota, the Dakotas and Iowa varying conditions are revealed, with a bulk of interest and buying coming from the rural districts. There has been a slight recession felt in the St. Louis district; sales in the Dakotas have fallen off a bit, but the corn crop has never been better, due to recent heavy rains, and the business prospects are bright. Missouri and Minnesota report business generally satisfactory in automotive lines, and that the outlook is exceptionally bright as far as crops are concerned.

Used cars have been moving fairly well, although the demand appears to have been slightly under that which was anticipated. However, used car stocks are low, generally, due to careful buying on the part of the dealers. Motor trucks have apparently shown quite an increase over last month, especially in the heavier types.

Collections are good, and money conditions are generally better than they have been for several years. The automobile factories in the St. Louis territory continue to maintain their high level of production, one having recently announced that it had increased its schedule.

In Alabama the sale of automobiles has held up well throughout the month just past. The sale of new cars has remained about the same, and used cars have shown a slight increase, as a result of strenuous efforts on the part of dealers.

New Orleans Report

New Orleans finds that business for June in most automotive wholesale lines was slightly over the May level. Rain came in time to save the truck crops in both Louisiana and Mississippi, and the rice crop of the former State. The one black spot now seems to be the sugar situation, for while crops of cane are in fine condition, the low market price does

(*Continued on page* 40)

Varied Car Display at Barcelona Show

Many Makers Exhibit Products at Annual Event—Planes Included This Year

MADRID, June 11 (by Mail)—The latest products of European automotive engineering were on display at the automobile and aircraft show in Barcelona.

Most of the exhibits naturally consisted of foreign products. Sizaire Brothers showed a car with a new type of spring suspension. The feature of another French car, the S A R A, was the air cooling system, which is expected to exert considerable influence on future design in the field of aircraft and automobile engines. Lancia, the Italian maker, presented several very attractive models, while the Austrian Steyr stood out by having its generator and magneto mounted on top of the engine.

Flexible Steering Gear

Lorraine-Dietrich exhibited a six-cylinder 15-hp. model with very appealing touring body and with what was described as a flexible steering gear. This car was one of the features of the exhibition. Peugeot exhibited several cars, one of them with a very attractive Weymann body with flexible joints.

On the Fiat stand was shown a sample of the new small No. 509, a 7-hp. model which will be placed on the market within three months. This is a four-cylinder model with inclined valves in the head, a three-speed transmission and four-wheel brakes. Among the items of equipment is an oil pressure indicator illuminated by an electric bulb. The engine speed ranges between 3000 and 3500 r.p.m. This two-seater was one of the novelties of the show. The car is to sell in Barcelona at 7,200 pesetas.

Display New Citroen

Citroen presented his three-passenger 10-hp. cabriolet, which, although it has been running elsewhere, was shown in Spain for the first time.

The Centro Electrotecnico y de Communicaciones presented a sectioned chassis in motion of the C E Y C 4-10 hp. light car. The two cranks are not set exactly opposite each other, but one reaches the dead center position a moment after the other, the lag apparently amounting to 4-6 mm.

On the Lincoln chassis the cylinder head was taken off and the crankcase bottom removed. Two and three-passenger military cars were exhibited by the Centro Electrotecnico, which manufactures for the Spanish Army exclusively. On the Chrysler car the hydraulic brakes attracted a great deal of attention.

One of the most interesting sections of the show was that devoted to aircraft. This was the first time that airplanes were exhibited in Barcelona. A Savoie No. 13 Scout and a No. 16 Bomber were shown by the Naval Air Service, both with Hispano-Suiza low compression engines of nominally 300 hp. and developing actually 280 hp. at the low compression. There was also one Black-Lerin machine with a 450-hp. Napier engine. A relief map of the landing field and another of the whole province of Barcelona, showing where landing fields will be located, were among the exhibits.

From the attendance standpoint the exhibition was a great success. The King and Queen attended, and this contributed materially to the success of the show. The Barcelona show has now been held four times, in 1919, 1922, 1924 and 1925, and twice it has been necessary to look for larger quarters. The largest number of exhibitors at the last show were French, followed by American, Italian and Spanish makers in the order named.

Paige Earns $1,682,498 In First Five Months

DETROIT, June 30—Paige-Detroit Motor Car Co. profits for May, including subsidiaries, after all charges, including preferred dividends but before Federal taxes, amounted to $702,597. This was the largest month in the history of the company, 5481 Paige and Jewett cars being shipped.

For the five months ending May 31, 1925, the net profits were $1,922,855 after all charges, including preferred dividends, but before Federal taxes. After deducting estimated Federal taxes the balance is $1,682,498, equivalent to $2.74 a share earned on the 615,000 shares of no par common stock.

"We have on hand today $4,770,000 in cash," said Harry M. Jewett, president. "There is no abatement in orders for cars. We have all the business we can handle at present, and indications are that this condition will continue throughout the summer."

ADOPT GASOLINE ENGINES

ALTOONA, PA., June 30—Branch lines of steam railroads are adopting the gasoline driven engines as power to haul passenger trains, the Pennsylvania Railroad placing gasoline cars on two divisions operating out of Hollidaysburg, Blair county. The Susquehanna and New York Railroad announces a gasoline engine passenger train service starting July 1 on one division.

The Pennsylvania railroad company placed the gasoline driven cars on the 10 and 15 mile spurs through a mining and farm community, the cars replacing the steam trains. More trips are possible with the gasoline train and more passengers are being hauled, the company and patrons being greatly pleased with the service, it is said.

MOON EXPORTS GAIN

ST. LOUIS, June 30—Export sales of Moon motor cars to foreign countries in the first five months of 1925 show a 50 per cent increase over export sales for the first five months for the year 1924, according to E. H. Serrano, export manager of the Moon Motor Car Co.

FINANCIAL NOTES

Murray Body Corp., and its predecessor companies in the twelve months ending Dec. 31, 1924, earned net income after all charges and taxes of $241,130, equivalent to 92 cents a share on the 230,150 shares of no par value common stock outstanding, after preferred dividends. The directors have declared four stock dividends on the common. As of July 1 there will be outstanding 233,598 shares of common stock, and this will be increased to approximately 7000 additional shares by the end of the year, when the stock dividend payments for this year are completed.

Stewart-Warner Speedometer Corp. may increase its dividend to a $6 or $7 basis the latter part of this year. Earnings in the current quarter are estimated at around $4 a share. Earnings in the first quarter were equal to $2.17 a share. Total earnings in the first six months of this year should run well in excess of the current annual dividend of $5 a share.

Firestone Tire & Rubber Co. has declared regular quarterly dividends on the common, payable July 20 to stock of record July 10. There has also been declared $1.50 on the 6 per cent preferred payable July 15 to stock of record July 1, and $1.75 on the 7 per cent preferred, payable Aug. 15 to stock of record Aug. 1.

Yellow Cab Co. of Montreal, Ltd., Canada, is offering $100,000 of its 7 per cent cumulative preferred stock at par carrying a bonus of 25 per cent in common stock. The authorized capitalization consists of $750,000 preferred stock divided into 7500 shares of $100, and 250,000 of common at $5.

Edmunds & Jones Corp. directors plan to declare an extra dividend payable to holders of record June 20, the amount to be determined at a future meeting. The regular quarterly payments on the common and preferred shares were authorized last week.

Dunlop Tire and Rubber Corp. of America is redeeming as of July 30 the first mortgage and collateral trust sinking fund 7 per cent convertible gold bonds, series A and B, at the principal and a premium of 5 per cent.

C. G. Spring and Bumper Co. has declared an extra dividend of 20 cents a share, payable July 15 to holders of record July 7. Earnings for the month of May, after deducting for taxes were $91,015.

McCord Radiator and Manufacturing Co., offering of 30,000 shares of class B stock voting trust certificates made at $22.50 a share has been oversubscribed and the subscription books closed.

Brockway Motor Truck Corp., 25,000 shares of class A no par common stock have been admitted to unlisted trading privileges on the New York Curb Market.

Austin Motor Co., Ltd., England, is negotiating for an issue of £1,500,000 of 6½ per cent debentures for the purpose of redeeming its fourth debenture stock.

Fisher Body Corp. has declared its regular quarterly dividend of $1.25 on the common stock, payable Aug. 1 to stock of record July 21.

Hupp Motor Car Corp., has declared its regular quarterly dividend of 25 cents on the common, payable Aug. 1 to stock of record July 15.

Coming Events

SHOWS

Sept. 14-19 — Cleveland, Public Auditorium, Annual Convention and Exposition, American Society for Steel Treating, W. H. Eisenman, secretary.

Sept. 21-26—London, England, Annual Cycle and Motorcycle Show under auspices of the British Cycle and Motorcycle Manufacturers and Traders Union, Ltd.

Sept. 28-Oct. 3—Chicago, Fourteenth annual Safety Congress and Exhibit, Rainbow Room, Hotel Winton, under direction of National Safety Council, A. M. Smith, business manager.

Oct. 5-9—Atlantic City, Young's Million Dollar Pier, Manufacturers' Exhibition in connection with American Electric Railway Association Convention.

Oct. 8-17—London, Olympia passenger car show.

Oct. 29-Nov. 7—London, annual truck show.

Nov. 26 - Dec. 6 — Berlin, Germany, Annual Automobile Show in the Kaiserdamm.

CONVENTIONS

Sept. 14-19 — Cleveland, Public Auditorium, Annual Convention and Exposition, American Society for Steel Treating.

Oct. 5-9—Atlantic City, Young's Million Dollar Pier, American Electric Railway Association.

Oct. 7-10—Montreal, Motor and Accessory Manufacturers Association Convention.

RACES

July 4—Salem, N. H.

July 26—Paris, Montlhery Track, French Grand Prix.
Sept. 7—Altoona, Pa.
Sept. 19—Syracuse, N. Y.
Sept. 30—Fresno, Cal.
Oct. 10—Baltimore-Washington Speedway, Laurel, Md.
Oct. 12—Salem, N. H.
Oct. 24—Charlotte, N. C.
Nov. 26—Los Angeles.

S.A.E. MEETINGS

National

Sept. 15-16—Production meeting and exhibition.
Sept. — Automotive Transportation meeting.
Nov. — Service Engineering meeting.

July Favorable for Automotive Selling

(*Continued from page* 38)

not give an encouraging outlook. Texas reports that prevailing crop uncertainty has affected practically all lines of automotive trade. Sales of both new and used cars decline in June from 5 to 8 per cent, and the same tendency was shown in other lines. However, the business as a whole was better than last year.

The sale of new cars continues in satisfactory volume in the Mountain States. General rains during the past month in those sections affected by the recent drouth have banished fears that it might ruin an otherwise excellent year in the automobile industry. Light car sales maintain a fair average, while medium priced cars show a slight increase over last year.

Used Car Sales Improve

Used car sales are beginning to show the results of the opening of the tourist season in the Colorado territory and are reported as being better than any month this year. From the Utah district, however, comes the less optimistic report that the used car market is improving, although conditions are not yet satisfactory and may not be for some time to come. Truck sales are showing a fair average.

It is reported that no seasonal decline has been felt in the Pacific Coast States, including Washington, Oregon and California, and that the month of June has at least equalled May in volume of sales. The lumber market in the Washington district is quiet, but its prospects are unusually bright because of the outlook for exceptional crops for the Northwest. Along with the report of excellent crops in California comes the statement that general business is holding steady at a good level.

Used cars are moving well and have ceased to be a problem of proportion enough to worry the dealers. Credit conditions are good, and collections are satisfactory. Conservative optimists feel that the Pacific Coast States region will absorb more cars in the next six months than they did during the same period a year ago.

DETROIT EMPLOYMENT REACHES NEW FIGURE

DETROIT, June 30—Weekly employment figures in the 79 automobile factories and accessories plants in Detroit recently reached the highest total of the year, according to figures released by the Detroit Employers Association.

The figures show 239,855 workers are now employed, an increase of 1408 over the previous month. Since the first of the year, when the number of workers employed reached 197,334, with the week ending Jan. 9, the figures have shown a steady increase with the exception of three weeks, when a slight reduction was reported.

Survey Proves Farmers' Prosperity Is Increasing

WASHINGTON, July 2—Prosperity of the average big farmer is increasing and with it his ability to more fully motorize his equipment, it was announced here this week by the Department of Agriculture following a comprehensive survey.

On 15,103 farms, it is shown, an average cash balance of $1,024, the margin of cash receipts over cash expenses, was returned to owner-operators in 1924 as against an average cash balance of $890 on 16,183 farms which were surveyed in 1923.

In addition to this 1924 margin, these farms increased inventories of crops, livestock, machinery and supplies $181, making an average return of $1,205 for the use of $17,260 of capital and the labor of the farmer and his family. These farms also produced food and fuel consumed on the farm estimated to be worth $266 on the average.

The balance of $1,024 in 1924 was all the cash the average of these farms made availble to the owner to pay his living expenses, take care of debts, and make improvements. Interest paid on debts during the year 1924 averaged $230, and the reported outlay for improvements averaged $133.

A.E.A. Annual Meet Held in Colorado

(*Continued from page* 31)

Quite a spirited discussion preceded the decision of the convention to rescind its action at New Orleans a year ago asking jobbers not to request manufacturer representatives at their shows. The resolution passed then did sanction sending representatives to jobber meetings.

The sentiment of the members, both manufacturers and wholesalers was that a mistake had been made at New Orleans as it was not desirable to encourage anything that would minimize the opportunities for education of jobber salesmen in merchandising of various items, a weakness readily admitted by all. This sentiment gathered considerable strength from the fact that Dr. Copeland and many other speakers at this meeting emphasized the necessity for closer cooperation between wholesaler and manufacturer in providing the automotive distribution that will best meet the buying habits and demand of the public. It was pointed out time and again that with the stabilization of the automotive industry a higher type of merchandiser is needed all along the line from manufacturer salesman down to retail dealer.

Manufacturers' advertising came in for considerable criticism at the manufacturers session, especially the waste in advertising that is directed to jobber salesmen. One criticism by a prominent mid-western jobber was that there were too many "campaigns" and that many good campaigns were not carried on long enough to gain the momentum they were capable of attaining.

INTERLOCKING TIRE SOLD

AKRON, June 29—Announcement is made by Attorneys Burch, Bacon & Denlinger of the sale of the Interlocking Cord Tire Co., which was thrown into bankruptcy several years ago, to B. F. Lepper of Mogadore, a majority bondholder, for $15,000. The company was originally capitalized for $1,000,000 and had 6000 stockholders. There will be a 5 per cent equity for bondholders, but none for creditors or stockholders.

AUTOMOTIVE INDUSTRIES
VOLUME 53 *New York, Thursday, July 9, 1925* NUMBER 2

Automotive Barometer Points to "Fair" as Half-Year Mark Is Passed

Production for first six months of 1925 ahead of first half of 1924 by some 110,000. Car stocks low and profits good. Insurance and time sales terms troublesome.

By Norman G. Shidle

THE automotive industry during the first six months of 1925 has made a record of which it may well be proud. Among its most important achievements are:

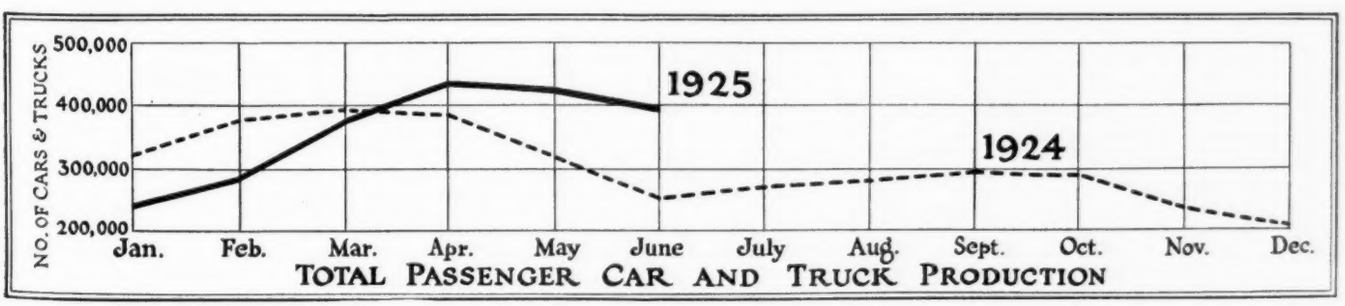
1. Production held in line with sales. New monthly production records have been set, but dealer stocks have not been increased beyond normal proportions.

2. Selling activity great enough to keep automotive stocks moving when stagnation or sub-normal business was being experienced in many other lines of trade.

3. Better handling of used cars, resulting in clearing used cars from dealers' floors, while at the same time new vehicles were being sold.

4. Efforts continued to cut factory overhead, to reduce sales costs and to decrease production expenses, resulting in materially increased profits, although production has been only slightly higher than that of the first half of 1924.

These desirable ends have been achieved on the basis of sound methods and sane commercial activities, which leave the way clear for good business throughout the rest of the year. Good profits and production for half a year have not



TOTAL PASSENGER CAR AND TRUCK PRODUCTION

Production for the first half of 1925 exceeds that of a similar period last year by about 110,000, although the first quarter this year ran below the first three months of 1924 by about 190,000. While the third quarter of 1925 is expected to drop below the second quarter, it is probable that total output for the year will exceed the 1924 total

been obtained at the expense of the last six months. Future business has not been discounted to any great extent by the exceptional activity since April 1.

That is the really important point to be recognized at the present time. Only in the extension of too liberal retail financing terms is there any hint of future sales having been discounted. That many buyers, otherwise not prospects, have been brought into the market through the small down payments and long time terms now obtainable cannot be denied. Some executives believe that the first signs of industrial decline will mean trouble among these marginal buyers and point to the fact that sales in coal mine districts already are considerably below those of surrounding territories.

Credits and Production

Easy money undoubtedly is one reason for the liberal time payment terms now available. With the tightening up of money, many of the difficulties along this line may be eliminated automatically. Nevertheless, the retail financing situation might as well be recognized as a cloud in an otherwise clear sky.

Those who predicted that more than 4,000,000 motor vehicles would be built in 1925 already are beginning copy for their "I-told-you-so" speeches. Here is the way they are reasoning today:

Total production for the first six months of 1924 was 2,054,561. For the first six months of 1925 it was about 2,165,000 or something like 110,000 ahead of last year.

Only 1,585,547 cars and trucks were built in the last six months of 1924. That was an average of about 265,000 vehicles a month.

The industry went into the last half of 1924 in bad shape. Dealers were overstocked with cars, factory warehouses were full, used cars weren't moving and everything seemed to be wrong. Still an average of 265,000 vehicles a month was built.

This year the situation is reversed. Dealers have on hand normal car stocks—a few of them still can't make deliveries. Used cars are moving quite well in many areas and factories haven't any surplus vehicles lying about the plant.

"If the industry built an average of 265,000 vehicles a month under the conditions which prevailed at the beginning of July last year," the optimists argue, "it certainly will have a better average in the last six months of this year when most of the signs are favorable.

"If production for the next six months averages only 275,000, the total output for the year will be over the 4,000,000 mark. It looks like a sure thing."

But the announcement of a sure thing always makes the skeptics prick up their ears, set their faces in a quizzical smirk and remark, "Well, we don't know about that. Let's see.

"Output for the first six months this year has averaged 360,000," they reason. "A large proportion of the total came in the last three months. Manufacturers had been very careful not to load dealers up with cars and dealers were prone to be overly conservative in estimating their needs. Good weather was a bit slow coming in many sections of the country.

"Consequently when spring really did open up, the stage was all set to necessitate a very high production to supply accumulated demand. The high production of the last few months doesn't mean anything but that.

"The automotive industry has been going along considerably in advance of nearly every other industry for many months. While it has been reporting new production and sales records the steel, clothing, coal and other industries have been having numerous ups and downs—some of them only downs. Sooner or later the automobile industry will come into adjustment with the general business condition. Temporary factors may keep it above the general level, but basically it is dependent for prosperity upon the progress of other industries.

"Too liberal time payment terms are being extended. These have stimulated sales temporarily, but finally will have an ill effect. Insurance rates are too high and are becoming a greater sales resistant as time goes on. Any moves the manufacturers may take along this line cannot affect the situation materially this year. Increasing traffic congestion will further hinder sales in urban areas. Used car sales will be unfavorably affected both by lower prices and by liberal time payment terms on new cars.

"All these factors must be considered in estimating business for the last half of 1925. Taking them into consideration the total probably will be something like 3,750,000 rather than 4,000,000."

There are two views of the situation as it exists today. You can take your pick.

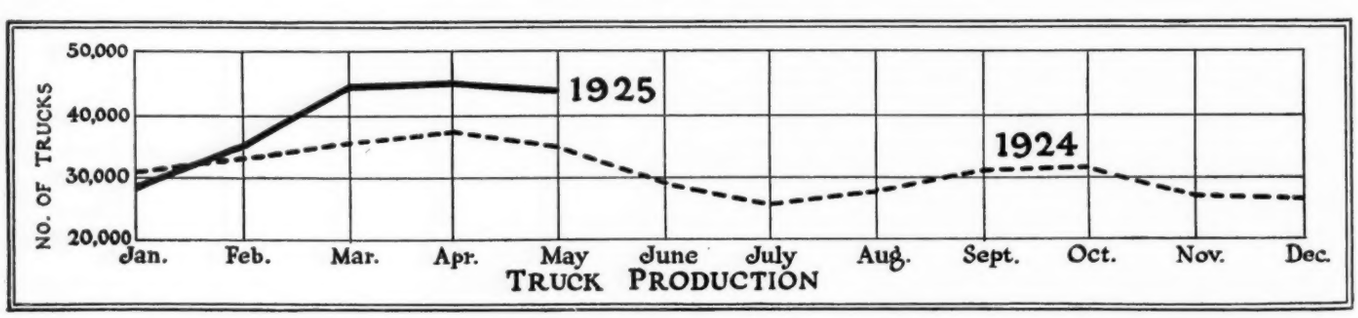
Last Half-Year to Be Good

On one point everybody is agreed. The last half of 1925 is certain to provide fairly good sales and good profits for the industry as a whole. There will be fewer car companies go out of business this year than in 1924 and some, which last year seemed to be definitely on the way out, may even show a profit when the 1925 books are balanced.

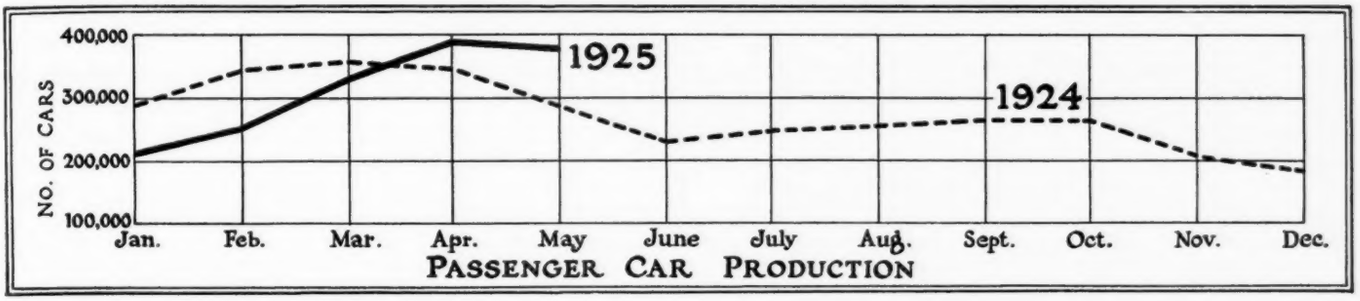
The energy with which manufacturers are going after the various problems which face the industry bodes well for the future. The increasing tendency to recognize difficulties frankly and to seek practical means to remedy them must be counted as one of the most favorable factors in the automotive situation today.

Among the problems being attacked at present, the most important are:

1. Fire and theft insurance
2. Replacement parts
3. Retail financing



Truck production and sales have been ahead of last year ever since February. The excellent showing made by the truck manufacturers is one of the out standing favorable aspects of the present automotive situation. June truck production held up well.



Car production has increased steadily since the first of this year, reaching a peak in April. June passenger car figures, while not available in detail, will run only slightly behind the May total.

Fire and theft insurance rates, in the opinion of the car manufacturers, are too high. Strenuous efforts to come to a better understanding with the insurance companies, the car builders say, have been unfruitful. The high procurement costs involved in the rates set by the average insurance company, combined with what the manufacturers consider unfair bases for certain rates, have brought about a situation which requires drastic remedies.

Insurance Rates Cause Concern

High insurance rates now act as a definite sales resistant. Many owners who feel that they must have fire and theft coverage if they own a car do not want to bear the financial burden now involved. If the rates were lower they would be far better car prospects.

Investigation of the entire situation has convinced most of the manufacturers that rates can be lowered. General Motors Corporation has gone ahead with the formation of its own insurance company to write insurance on what it considers a more reasonable basis. Chrysler has announced a new insurance plan which, while compelling every Chrysler owner to carry insurance for a year, gives him that insurance at a much lower rate than it could be obtained through the regular insurance channels. The National Automobile Chamber of Commerce has appointed a committee to go into the possibility of setting up an insurance company to write insurance for automobile owners at the lowest possible rate.

There is no real desire on the part of the car makers to get into the insurance business, but insurance rates have become so important a factor in sales that no other course seems to be open at the present moment. There seems to be every likelihood that the automobile manufacturers either will set up an independent insurance company or buy in some existing organization, unless some change occurs in the present insurance situation.

Manufacturers After Parts Business

Next to insurance, the replacement parts situation is engaging the attention of the manufacturers. Car builders have realized for a long while that they were losing a considerable portion of the replacement parts business which they would like to have had. The feeling has been growing that only through sound merchandising methods and competitive selling could any considerable proportion of the business be regained. The National Automobile Chamber of Commerce, as is generally known, appointed a committee only a short time ago to look into this question and to recommend future action.

As regards retail financing, little remains to be said just now. As indicated previously, concern is being felt over the liberality of the terms being extended in many places and efforts are being made to stabilize the situation. An outside viewpoint on automobile financing is of interest in this connection.

Such a viewpoint was obtained by AUTOMOTIVE INDUSTRIES this week in an interview with William Walker Orr, manager, Eastern Division, National Association of Credit Men. Mr. Orr gave it as his own private opinion, based on many years of experience in general credit matters, that automobile dealers and finance companies should insist on down payments of not less than one-third of the delivered car price in all time sales, and that the balance should be made payable in not more than 12 months.

"Longer terms than this are at variance with the best principles of credit," said Mr. Orr. "In fact, I feel that to be on the safe side the transaction should be limited to less than 12 months wherever possible. And it is assuredly a mistake to deliver a car on any down payment of less than one-third of the retail value.

"When easier terms are offered, say 20 or 25 per cent as a down payment and 14, 16 or 18 months for the balance, many people who cannot afford to own or operate a car are tempted to become owners. They somehow get together the money for the initial payment, and the small proportion of repossessions which come to our attention show that they manage to meet their monthly notes until the car is entirely paid for, but we receive complaints that other obligations are neglected in the process.

Car Buying Has Broad Effects

"Merchants in other lines, particularly grocers and butchers, are suffering.

"The financing of automobile paper has proved an extremely profitable business. The nation has been very prosperous during the last several years and the purchasing power of the public has been tremendous. While business continues as good as at present the risk involved in time sales is relatively small. This situation has induced innumerable small finance companies to enter the automobile field. It has been easy for them to get financial backing, principally from trust companies.

"With conditions so favorable most of these finance companies have been successful and have not hesitated to ease up on their terms if by so doing they could get the jump on some competitor operating in the same territory. This competition on the basis of long terms is dangerous, for if a depression should develop, causing unemployment and a general restriction of credit, there would be trouble.

"No man in the expansion of his business should lose sight of the fact that there is always the possibility of having to face conditions far different from the comfortable situation that we now seem to be enjoying."

On the whole, however, the favorable aspects of the automotive situation are far more numerous and far stronger than are the unfavorable factors as the industry enters the second half of 1925. Regardless of whether total production for the year turns out to be $3,750,000 or in excess of $4,000,000, the twelve months of 1925 will go down in automotive history as prosperous ones for the industry as a whole and for almost every individual company in it.

Germany Adopts Time Payment Plan to Bolster Car Sales

Over 90 per cent of retail automobile business now done on credit system. Dealers, caught in deflation, handicapped by lack of capital. Interesting report pictures situation.

ONE of the important developments of 1925 in the German automobile industry has been the general adoption of time payment plans to bolster retail sales. Until this year most sales were made on a strictly cash basis. Late in 1924, however, when the financial system of the country was undergoing reorganization, capital became so scarce that an unusually high rate of interest was demanded by the banks. Owing to the high value of their merchandise, the automobile dealers had to have capital, but they could get it only by paying the high rates. In many cases it was entirely impossible to obtain money in the usual way, by discounting customers' notes, for the reason that the agencies of the Reichsbank refused to discount automobile paper.

The automobile trade was compelled to make up for losses due to high interest rates by aiming at a rapid turnover, and this was made difficult by the fact that purchasers more and more insisted on time payments on a considerable portion of the purchase price. The year 1925 thus began by placing the automobile business on the instalment plan basis, even though it is not yet organized along this line to anything like the extent it is in France and the United States.

Numerous firms have reported that 90 per cent of their total sales could be effected only on a time basis. In view of the general restriction of credit it is not easy for dealers to do business on this basis, for not only do they not receive any credit from manufacturers (with a few exceptions) but are even compelled to make substantial deposits upon placing their order, and in any case they must pay the balance before the car is delivered. The dealer is very unfavorably situated in that he is not in a position to enforce the same terms toward customers as the industry enforces toward him. He is compelled to somehow effect an equalization, and this is a function which has not been fully appreciated by the industry so far.

Report by Dealers' Manager

These are some of the facts contained in an interesting report on the automobile situation in Germany recently issued by General Manager Johannes Buschmann of the German Automobile Dealers' Association.

In his introduction Mr. Buschmann reviews the general trend of economic affairs in Germany. It was just before the beginning of 1924 that inflation reached its peak and the return to sound money was made. The immediate result was an extreme scarcity of capital and credit, but this did not become fully apparent until April, when the Reichsbank, in order to protect the new currency against inflation, decided to curtail commercial credits drastically. This was followed by a great slump in all kinds of commercial activity, which lasted from May to August. Business began to pick up again only in the fall, after the acceptance of the Dawes plan had made possible the London agreement and the flotation of large Government and private loans abroad.

Aside from the return to a sound currency, probably the most significant event of last year from the business standpoint was the reestablishment of the economic unity of the country, which had been disrupted by the occupation of the Ruhr district. It is asserted in the report that the economic separation of the occupied districts from the rest of Germany and their exploitation as reparation provinces by France and Belgium had such disastrous effects on German business that, had it lasted only a year longer, it would have resulted in the complete economic ruin of the country.

Getting Back in World Trade

The year 1924 not only saw a consolidation of the bases of domestic business but it also witnessed the first steps toward the reestablishment of ordered business relations with other countries. On Jan. 10, 1925, Germany regained its liberty of action in economic matters toward the allied countries, and although the Government has been much occupied during the past year with proposals for commercial treaties, it has not been possible so far to reach agreements with all of the most important countries. From the automotive point of view the treaties concluded with England and the United States, which still require ratification, are of the greatest importance.

Conditions in the automobile trade in 1924 reflected the general commercial situation. During the first few months of the year the turnover was good and further developments were looked forward to with confidence. But the sudden restriction of credit by the Reichsbank in April immediately klled all buying interest, and from May far into the fall the business was simply dead. A slight improvement was noticeable in October.

The automobile trade was hit particularly by this turn of events. Toward the end of 1923, shortly before the introduction of sound money, the manufacturers had arbitrarily raised prices about 100 per cent, in view of the lack of a stable currency, but after the introduction of the rentenmark they decreased their prices by only a fraction of the previous increase. Consequently, at the beginning of 1924 German automobile prices were abnormally high. Nevertheless, as a result of the favorable economic condition which was maintained by the liberal rentenmark credits of the Reichsbank, the demand was so brisk that manufacturers had no reason to cut prices. This situation misled many dealers into stocking up with cars sufficient for a considerable period.

Then quite unexpectedly, in April, came the slump, accompanied by a regular buyers' strike, which was followed by material price reductions on the part of the factories, so that undoubtedly many of the dealers suffered a loss of from 20 to 30 per cent on the stocks which they carried from 1923 into 1924.

In view of the many difficulties the automobile trade had to contend with in 1924, it is not to be wondered at that it was not entirely free from bankruptcies and liquidations, but as compared with many other lines they were relatively small in number.

The total number of automobiles in service in Germany showed a considerable increase in the course of the year. The census of July 1, 1924, showed an increase of 38 per cent as compared with only 28 per cent from 1922 to 1923. In absolute figures the increase amounted to 80,239 vehicles, that is, almost as many as the total number in use before the war. The figures here given include motorcycles, and both the absolute and the relative increase was largest for this type of vehicle, the relative increase amounting to about two-thirds of the number in use the previous year.

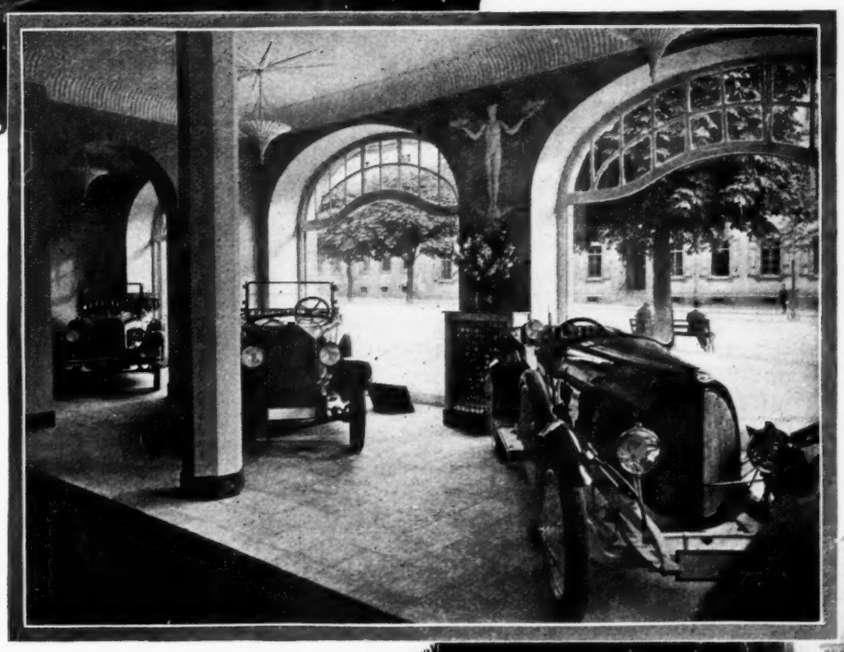
In spite of the very considerable general increase in the use of motor vehicles, the number of passenger cars in use by Government departments and municipalities decreased, and the number of trucks thus used increased only slightly. The increase was also slight in public transport services and in agriculture and forestry.

As in previous years, the large majority of vehicles were propelled by gasoline engines. The number of electrically propelled passenger cars increased from 1102 to 1414 during the year, and the number of electric trucks from 1644 to 1852. As compared with other leading motor car-using States, the density of automobiles in Germany is as yet quite low, there being one motor vehicle to every 210 of the population and, if only automobiles and commercial vehicles are counted, only one to every 316 of the population.

That the number of passenger cars increased by about 32,000, or about one-third, from July, 1923, to July, 1924, Mr. Buschmann says, reflects the constantly growing demand for the time saving motor car. All reports received by the management of the Association emphasize the fact that the demand is constantly on the increase and is being held up only temporarily by the general depression. The demand, however, is turning more and more in the direction of the small utility car. The fact that the German industry has not sufficiently developed this type is bound to hamper trade.

There is a large demand for a vehicle at 4,000 to 5,000 marks, for business and professional purposes. Such vehicles have been brought out by certain German manufacturers, but their production has not kept pace with the demand. This also

Potsdam Square, Berlin, with the Winter Garten in the background. Note the traffic tower in the center. This tower is a replica of those on Fifth Avenue, New York



An artistically appointed German automobile show room, home of the August-Fohr agency, Freiburg, Baden

Automobile parking space in front of the Cologne Cathedral, Cologne, Germany

is one of the reasons why, during 1924, there grew up an exceptionally strong demand for certain popular priced foreign cars, which, however, could be met only to an insignificant extent, owing to the paucity of the import permits issued.

It is gradually being recognized in Germany that the automobile is primarily a business and utilitarian vehicle, and that it does not need to be of flashy or sporty appearance. The large, sporting type vehicle, which played an important rôle during the inflation period, is passing into the background more and more.

Used Chiefly for Business

Practically all of the potential buyers are people who wish to use the car for business or professional purposes. One section of the population which in other countries, including England, France and the United States, furnishes a considerable number of buyers, namely Government and commercial employees, does not count at all in Germany as a source of prospects.

The trend of prices was generally downward during the year. Price reductions on passenger cars on the average amounted to 10 per cent, but some factories raised their prices again an equivalent amount after the show last December. The general complaint of prospects is that price levels are too high.

Business in used cars did not assume any great volume as compared with previous years, and prices were depressed, even though the offerings were limited. Older designs, and especially cars without electric light and starter, are not given consideration by buyers.

In the truck business there is apparent a tendency toward the light truck of one and two tons capacity. This marks the beginning of a development in Germany which in the United States, for instance, has resulted in 80 per cent of all trucks being of this type, while in Germany 80 per cent are of the heavy type. The demand is partly for delivery wagons for use in cities but partly for goods transportation over longer distances, and Mr. Buschmann thinks that this change should turn out for the good of the roads. The advantage of the motor truck over the railroad in short distance hauls is being recognized more and more. It could be endangered only by overtaxation, such as that proposed under the title of prepayment for road maintenance. This fortunately has been declared unconstitutional in the lower court.

General Price Reduction

Toward the end of September the motor truck manufacturers' price convention came to an end, and the results are generally regarded favorably. A general price reduction of from 20 to 30 per cent was the most important of these. The trade in used commercial cars suffered even more than that in used passenger cars under low prices.

In the motorcycle trade the tendency has been away from the light type, for which the demand was by far the greatest in earlier years. Most of the business is being done in machines of medium power.

In the German automobile industry there were a number of additional amalgamations during 1924. To the earlier consolidations of the G. D. A. and the D. A. K., which were conceived only as sales alliances, there have been added the apparently much more closely knit unions of Dinos-Aga and Daimler-Benz, which seem to be intended to function as manufacturing consolidations. The latter began its activities by depriving of their franchises a number of firms which had sold their products for periods up to more than a decade, installing their own branches.

Referring to the relations between the automobile trade and the industry in Germany, Mr. Buschmann says the former realizes that there is need for thorough cooperation if the German industry is to hold its own in competition with foreign industries, which in some cases have a lead over it. However, the solution of the problem lies chiefly in the adoption of more efficient production methods, and if attempts are made in that direction it will be found that the existence of a capable and independent automobile trade is one of the pre-requisites to the successful carrying through of large scale production programs, the same as it has been found in the United States.

Until the end of 1923 the German automobile industry had a monopoly of the home market and, although since then the importation of small numbers of cars has been permitted, this monopoly has not been in any sense endangered, in view of the much greater demand. This state of affairs was reflected in 1924 in the relations between the industry and the trade.

The Dealers' Association during the past year formulated a new proposed standard contract to replace the present standard form, but it did not succeed in reaching an agreement regarding the subject with the Manufacturers' Association. However, the dealers of one of the larger German manufacturers succeeded in inducing that manufacturer to adopt a new from patterned after that proposed by the Dealers' Association.

Studying Garage Design

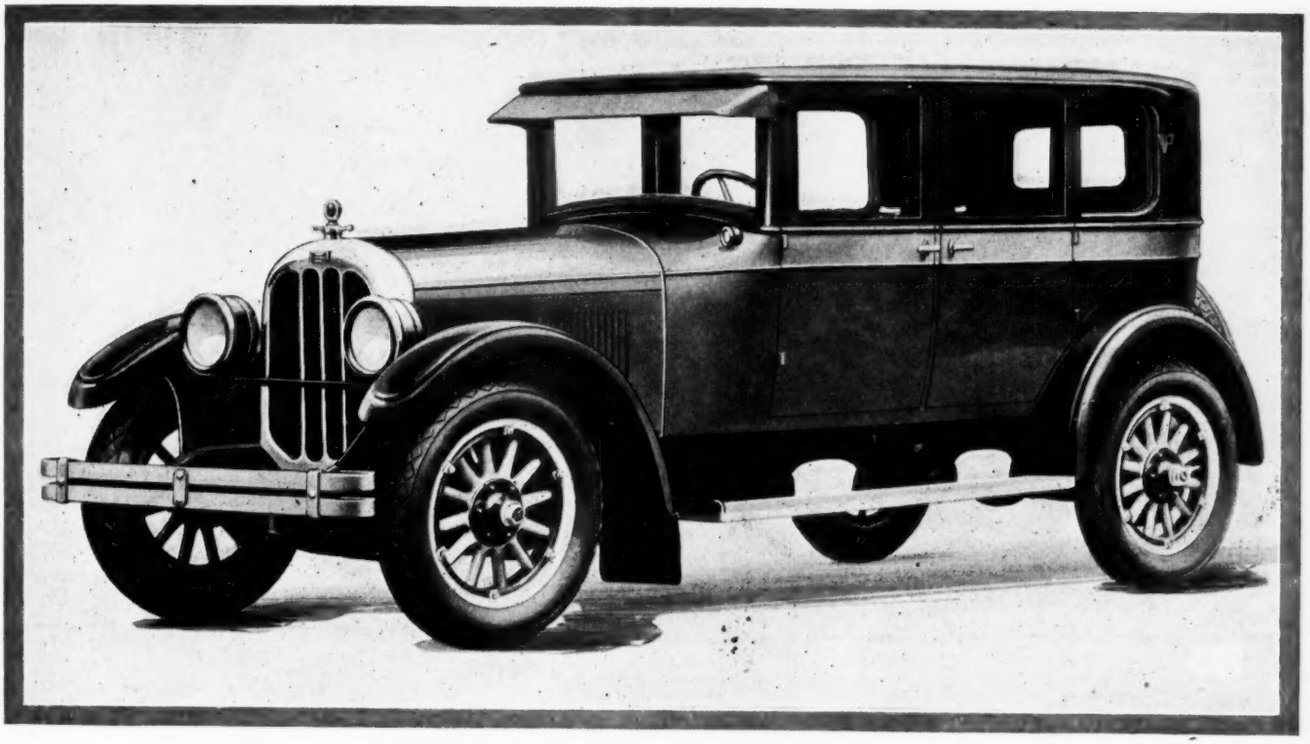
Much attention is being given to the problem of garage design in Germany at present and a number of prominent architects and engineers are working on it. Existing building codes and fire inspectors' rules are a great hindrance to the rational design of large garages, and Germany will have to take advantage of the experience of other countries. A Committee on Garages of the German Society for Construction Engineering, on which the Dealers' Association is represented, is at present considering a revision of the building and fire protection regulations.

Although the demand for garage accommodation increased largely, it could be fully met. In Berlin there will probably be a surplus of garage space before long.

The Association is strongly opposed to attempts on the part of certain municipalities to erect and engage in the operation of commercial garages. It points out that although there is still a decided scarcity of houses in many German cities and that if the municipalities want to build they should build human dwellings. In many cities also there is a scarcity of hotel accommodations, and yet the municipal governments take no steps to remedy the situation by erecting municipal hotels.

Some trouble has been encountered during the past year with labor unions. The Union of Mechanics has been endeavoring to make membership in it compulsory to all automobile repairmen. On the other hand, the Blacksmiths' Union is said to make the claim that the automobile business really belongs to it, for the reason that the automobile is a vehicle and vehicle repairs have always been recognized as coming within the province of the blacksmith. The Dealers' Association holds that it would be illogical to group automobile mechanics with sewing machine and typewriter mechanics and that the trade of automobile mechanic should be recognized as a separate and independent trade.

German imports of automobiles, etc., during the year 1924 were as follows: Passenger cars and chassis for same, 4827; motor trucks and tractors and chassis for same, 829; motorcycles, 1606.



New 1926 Chandler Metropolitan Sedan, showing double belt effect and nickel radiator bars

1926 Chandlers Have Two-Tone Finish and Nickel Radiator Bars

Line includes new 7-passenger closed model. Rear quarter windows of Metropolitan sedan enlarged. Small flywheel used at front of engine. New manifold. No price changes.

By Leslie S. Gillette

EXCEPT for the addition of a new body model, snappier appearance, slight changes in the "Metropolitan" sedan, several engine modications and a new style radiator, the 1926 Chandler cars, now ready for the market, are substantially the same as the 1925 models, there being no change in prices or company policy.

While the general contour of the new radiator is identical with the previous models, an individual style is achieved by having three vertical strips spaced about four inches apart and extending down the front of the radiator, somewhat after the manner of the latest Franklin and Velie models. These triple bars, which are of channel section, are pressed out of the same stock and in the same operation as the steel radiator shell, which, including the bars, is heavily nickel plated.

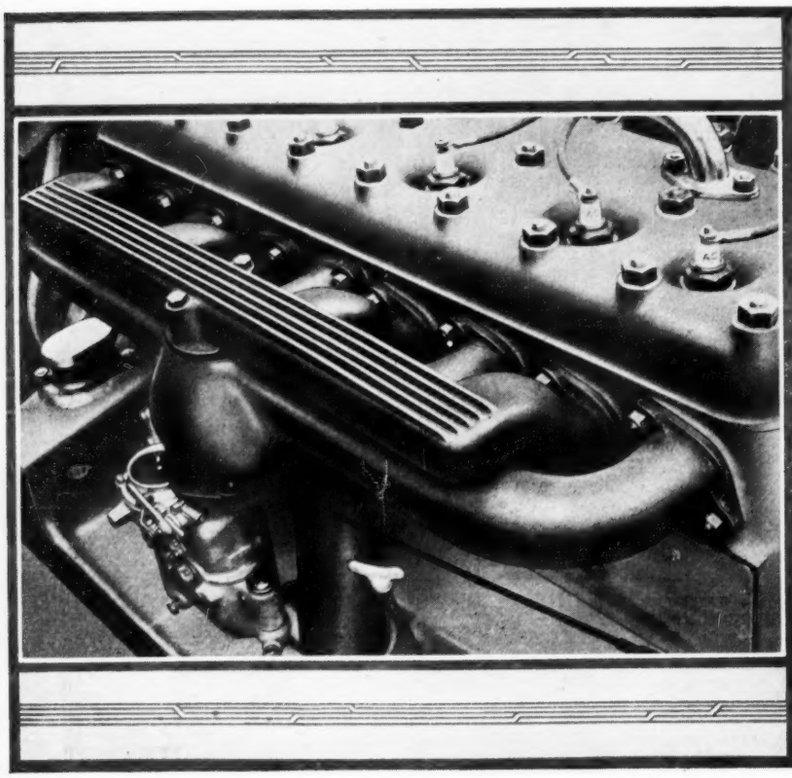
A new name plate of gun-metal having the letters in white enamel on a black background with a gold border extending around the design is now employed.

The new seven-passenger capacity sedan lists at $2,195 and replaces the former model at that price. The most noticeable change in appearance of the new sedan over the old model is the rounding of the corners on the rear quarter upper section, the use of heavy beading to give the double belt effect, a one-piece vision-ventilating windshield and a new color scheme. The last mentioned is a Duco two-tone brown finish while a sage brush green is offered at no additional cost.

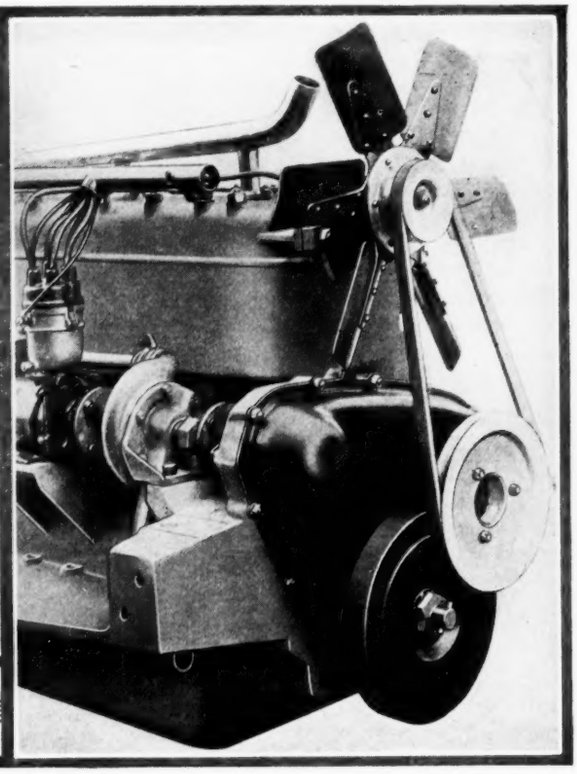
To allow greater vision and visibility for the passengers in the tonneau, changes have been made on the "Metropolitan" sedan. The landau bows formerly mounted on either side of the body at the rear have been eliminated and their place taken by windows of larger dimensions than previously used. Leather was formerly used to cover the rear quarter upper section, but this is now a pressed steel stamping. Except for the addition of an automatic windshield cleaner on the seven-passenger sedan, the equipment on both new bodies is the same as that employed on the models they supersede.

Recent Refinements

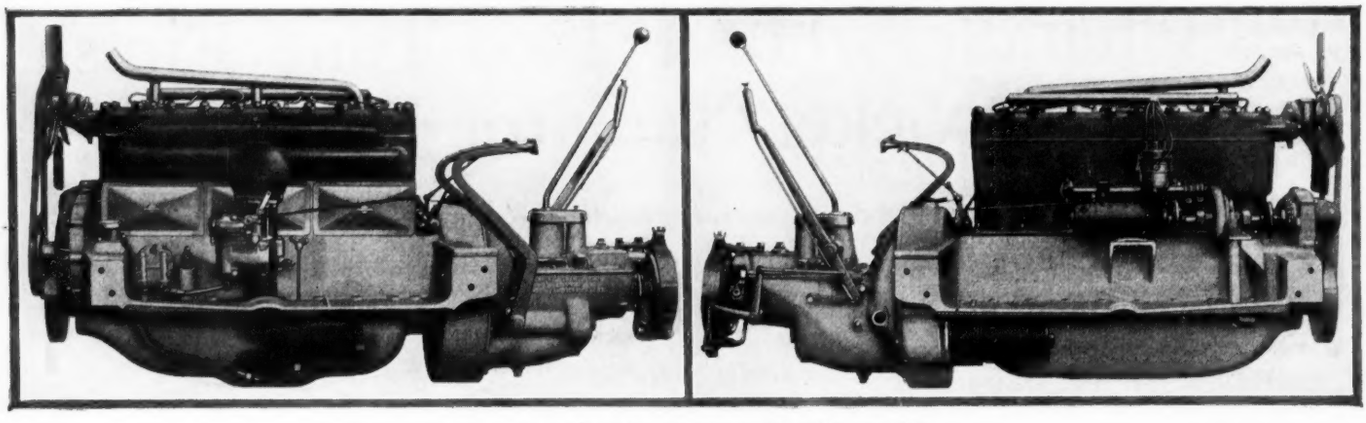
In line with the company policy of not making announcements of changes in design at definite annual periods, the following refinements have been incorporated in the Chandler cars during the past several months. The ignition system, which used to be mounted on a separate platform and driven through a coupling from the rear of the generator, is now a part of the latter, forming a single unit. The position of the generator remains unchanged



Chandler manifold is ribbed to increase cooling surface



A front view of Chandler engine, showing small flywheel at forward end of crankshaft



Left and right side views of Chandler engine

while the make of the unit is American Bosch as formerly.

Reduced engine vibration, smoother running and fuel economy have been attained by the addition of a small flywheel carried at the forward end of the crankshaft and a newly developed manifold.

Unusual design of the manifold now permits the exhaust gases to flow through a separate passage cast in the intake manifold and from there the gases are carried behind the centrally located carbureter to the muffler pipe. The exhause manifold, which is a separate casting, is now ribbed on the top with five fins to assist in cooling the gases and is secured to the intake manifold by two cap screws. On the previous engines, the mixture was preheated by a hot spot forming part of the intake which was bolted to the exhaust manifold. The exhaust pipe also, instead of leaving the manifold at the middle of the engine, was carried down the front of the powerplant just behind the radiator.

Slight modifications in the clutch have reduced the overall length of the transmission housing by two inches, while minor changes have been made in the transmission brake hook-up.

TWO apparently successful designs of exhaust silencers mounted on aviation engines are now undergoing service tests at McCook Field, the Air Service announces. Both have been designed and constructed by the Engineering Division. These designs, known as the whirl-chamber type, have been built for use with the Liberty 12 engine. These silencers are now installed in DH4B P-299. They are attached directly to the engine, while long, compactly designed pipes lead from the silencers, carrying exhaust gases clear of both cockpits. The overall dimension of the silencers is quite small; in fact, they are the smallest ever constructed for a power output as great as that of the Liberty 12.

The development of this equipment was requested by General Patrick, who found the noise of the engine and the vibration harrassing to ears and nerves, especially on his many long flights and a pair of the silencers are now being made for installation on the General's airplane.

Just Among Ourselves

Franklin Rebates Dealers When Prices Are Cut

ANOTHER company is hereby added to the list of those which make a practice of rebating dealers on cars in stock when prices are cut. Franklin is the new arrival to our list, but, according to sales manager S. E. Ackerman, has been operating on this basis for the past two years. That boosts our list to five, namely, Studebaker, Packard, Nash, Hupmobile and Franklin. Any more?

Sales and Service Around the World

ASIDE from its value as a publicity stunt, the completion of a world tour by the Buick car which returned to New York last week did have a symbolic significance for the whole industry. The car was driven by Buick distributors from one territory to another. This method served to show the extent of Buick's foreign representation in particular and to exemplify in general the huge proportions already reached by automotive transportation outside of this country. It indicates also the intensity and persistence with which export sales are being cultivated and the strength of the efforts being used to increase automotive business abroad.

Savings Increase as Registrations Grow

EVERY once in a while somebody comes along to denounce the automobile as a home wrecker and a despoiler of the wage earner's bank account. Just as regularly facts and figures pop up to disprove such statements. We were particularly interested in some figures given out recently by A. E. Duncan of the Commercial Credit Co. of Baltimore which show that the number of savings depositors have increased from 16,084,587 in 1915 to 38,867,994 in 1924. Deposits per capita grew from $88 to $186 during the same period. In the meantime automobile registrations had been increasing from about 2,500,000 to something like 17,500,000. So that's that.

Publicity By Inverse Methods

"THEY say a good fire department is known by the fires it doesn't have. Could a publicity department be judged by the stuff it doesn't send out?" asks A. M. Taylor, Velie's new advertising manager in a letter sent the other day to automobile editors of daily papers. We'll say it can! Constant struggling and striving for publicity almost inevitably results in strained and diluted material on frequent occasions. Few organizations in the industry have something of general interest happen every week. Ask any conscientious business paper editor and see if he doesn't say that the amount of real news coming from any single plant, large or small, usually is in inverse proportion to the amount of canned publicity sent out by the organization.

Junking the Ballyhoo in Favor of News

SO many of Mr. Taylor's ideas seem to be in accord with ours that we want to pass them on. He says, among other things, "In our opinion the automobile page of a daily paper which is not edited from the standpoint of reader interest does not command attention. The lineage may measure up big, but as Rube Goldberg would say, 'It doesn't mean anything.' This letter is to break the surprising tidings to you that we won't have much news to send out—and we won't send out much that isn't news." Seems like sound doctrine for all publicity departments.

Does Publicity Get Better or Worse?

WHILE we're on this subject, it's only fair to remark that improvement in automobile publicity is noticeable in the last five years. Much of it still is very bad, but there has been a steady influx into the factories of publicity and advertising men who see their problems in a broad constructive light; who understand the editorial as well as the advertising side of publishing; and who see the advertising advantage of helping to build the reading pages by refraining from seeking publication of editorial balderdash and by trying to help the editors get material of real value to their subscribers. We can name offhand at least six automobile companies whose publicity we read with eagerness and interest every time any of it comes to our desk, not to mention some of the work being done in the parts and accessory fields. Some of these six we don't hear from for weeks at a time, but every time they are represented in the morning mail they contribute useful information or an idea. And after all, the automobile business is based on the application of constructive ideas to sound information.

N. G. S.

Aggressive Methods Needed to Develop More Sales in Orient

Far East would buy more U. S. cars if sales were pushed, delegates are told at meeting of National Foreign Trade Council in Seattle. Export trade and rubber supply discussed.

AGGRESSIVE methods to popularize automobiles in the Orient, similar to those used in the United States, would result in greatly increased sales in that part of the world, according to representatives of the Far East who presented their views of American foreign merchandising to the twelfth annual convention of the National Foreign Trade Council in Seattle.

The possibility of more business in the Orient was one of the chief points of automotive interest at the convention, but other developments of equal importance were:

1. Urgent request by Judge J. W. Huasserman of Manila, vice-president of the American Chamber of Commerce, that Congress take immediate steps to remove restrictions against private capital developing great areas of rubber lands in the Philippine Islands, and a statement by E. L. Harris, consul-general at Singapore, that "Great Britain has a firm grip on the rubber industry in the Far East."

2. Highly optimistic predictions for the immediate future of automotive foreign trade based on the unusually healthy condition of American foreign trade in general and the marked progress made by the automotive industry in particular.

3. Expression of general sentiment among delegates that American factories can, if they will show the same initiative and intelligence in foreign as in domestic markets, compete with other countries despite higher wages and costs in America.

4. Reiteration by U. S. Government representatives of the fact that a good export trade in many years will mean the difference between prosperity and depression in the automotive, as well as in other industries.

The Chinese have a preference for American goods and American business men. Here is an American automobile in a typical Chinese setting, the structure in the background being one of the ornamented watch-towers which stand at intervals along the Great Wall of China, near Pekin

Stronger Sales Effort Urged

Since the slogan of the convention was "Where the Occident and Orient Meet," discussion naturally hinged about trade with the Far East. Delegates from across the Pacific pointed out the great untouched market for motor vehicles which lies in the Orient and expressed pleasure at the increased representation of American firms doing business there in recent years.

Immediately after the earthquake, when transportation was so essential, the Japanese turned to automobiles as never before, and the economy and advantages of the motor car are better known in the cities there today than at any previous time. The Oriental delegates think that the American automobile companies have not been as persistent and energetic as they should be to increase their own business, and cited the success electrical equipment manufacturers have met with in the Orient, including the General Electric and Westinghouse, because they have been aggressive in building up business and educating the people to the use of their products.

It was the universal comment of these Oriental representatives that Americans have not been as active in the Far Eastern market as the British, although the Japanese and Chinese have a preference for American goods and American business men. They pointed out that Americans are prone to send over salesmen when business conditions are good in the Orient and to withdraw the salesmen when trade slackens. The British, on the contrary, keep a permanent sales force. Consequently, during dull times the British make contacts and build up business

which the Americans find hard to regain when they reenter the field. It was pointed out, for instance, that Siberia, although depressed by Soviet rule, is ready to buy American automobiles and particularly second hand American automobiles if the field is cultivated.

Going into the history of China's foreign trade, Mr. Tse-Tsok-Koi, a prominent electric supply dealer in Canton, said that because of foreign firms not knowing the language or conditions there they did business through a middleman, known as a "compradore." He advocated doing away with this system and adopting a method of direct dealing with the Chinese business men.

Chinese Seek Long Credit Terms

Means must be devised to extend a longer period of credit to the Chinese if America is to do business on the same basis as its continental competitors, Mr. Tse declared, adding that the Chinese credit system is very extensive, settlements being made only four times a year.

Alluding to the shipping phase of foreign trade with China, Mr. Tse said packing was a very important factor.

"A shipment is subjected to more rough handling, perhaps, between two ports of transit when in China than during the entire railway and ocean trip from America," he declared.

The United States bought $100,000,000 of Philippine products in 1924 and sold in the islands goods to the value of $60,000,000, this trade being 64 per cent of the islands' total commerce. The trade could be made far larger and more important to both countries if it were not for the uncertainty of continued American control of the islands and obnoxious restrictions on land ownership. These restrictions retard agricultural development and adversely affect the buying power of the islands.

While Far Eastern markets were stressed, automotive prospects in other parts of the world got some attention as well.

Mexico was presented as a close profitable field for American products and special mention was made of the possibilities there for sale of lower priced cars. American firms have not been persistent enough in remaining in Mexico during slack times or in establishing permanent connections there, said A. Dye in discussing selling methods in that country. He said the day of the itinerant salesman is passing rapidly and that Mexicans prefer to do business with institutions with branch offices, or at least permanent connections, rather than with an independent salesman, no matter how agreeable he may be.

Mexican Methods Familiar

"Seventy-five per cent of the selling methods in Mexico are the same as in the United States," he declared. "Many of them have been borrowed from us. Methods that have worked well here, as a rule, will work well there, and a good salesman here will make good in Mexico. Tact, courtesy and a knowledge of the people and their customs are a greater asset to a salesman than a knowledge of the language, though that is valuable."

Mexican merchants are easy to do business with after acquaintance has been established, he said. Therefore, he advised merchants not to change salesmen without good cause.

Pointing out the productive capacity of Mexico and the desirability of building up reciprocal trade relations with the United States, one speaker said: "Mexico alone could furnish a foreign market that would keep the wheels of all American factories running for years."

Business conditions are unusually good for this time of the year, declared W. S. Knudsen, president of the Chevrolet Motor Car Company.

"Nearly every motor car company in the United States is selling all the machines it can make," said Mr. Knudsen. "Export trade is also showing an increase, expecially to Copenhagen, Buenos Aires, Australia and Japan. Unsettled conditions in China have prevented a general increase in business to that nation."

The advantages of the automobile are better understood and appreciated in Japan today than ever before. This picture was taken in Tokio, but it has all the atmosphere of a World Series stampede at an American ball park

The convention interested itself in the problem of a rubber supply for America. Commercial attachés of the United States in the Orient pointed out that Great Britain has a monopoly on the rubber production in the South Pacific and that only competition will bring down the price, which is now the highest in history. The United States is the largest consumer, using 70 per cent of the world supply now controlled by Great Britain. Consequently America must pay the toll, and delegates charged that through this control England is funding its war debt to the United States on a sixty-year plan.

Ernest L. Harris, American consul-general recently stationed at Singapore, reported that "Great Britain has a firm grip on the rubber industry in the Far East."

British Control Oriental Rubber

Mr. Harris described the British policy, applied to rubber in the Malay peninsula, on which the Straits Settlements are situated.

"Before estate rubber can be grown in any other part of the world—even in Sumatra, where Americans own about 1,000,000 acres of rubber lands—conditions must be produced similar to those which obtain in Malaya," he declared.

The heart of the British policy, as reported by Mr. Harris, is cheap labor. And he said the same principles are being applied to the tin industry in the Straits Set-

tlements. Labor for rubber comes from India and that for tin from China.

In Malaya the policy of unrestricted immigration and emigration was established, and during the past 25 years 700,000 Tamils have wandered across the Bengal Sea to Malaya, from India.

A wage scale of 10 to 30 cents a day prevails. The question of labor has been solved. From the very beginning political stability was taken into consideration. The exceptional qualities of climate and soil and the wise policy of the British to rule firmly in Malaya and give the planter every reasonable support created an ideal situation for growing rubber.

Removal of Restrictions Suggested

Congress should take immediate steps to remove restrictions against private capital developing great areas of rubber lands in the Philippine Islands, thus assuring a sufficient crop of this product for American needs and at the same time creating a vast foreign trade between the two countries, Judge J. W. Hausserman of Manila, vice-president of the American Chamber of Commerce, told the convention.

E. P. Thomas, president of the United States Steel Products Company, declared the international customs convention, to meet next October, will take steps to end present civil disorders in China by increasing Chinese customs 50 per cent to give the Central Government more funds to operate and stabilize govermental and financial affairs.

Since automotive foreign trade depends to a large extent on the same fundamentals as general exporting, the present favorable condition of all overseas sales is encouraging.

For the first five months of this year up to June 1 the exports of the United States totaled $2,039,700,000, as compared with $1,183,700,000 for the corresponding period of 1924. In the same period imports for this year aggregated $1,642,100,000, as compared with $1,576,900,000 in 1924. This gives a total value of foreign trade of $3,681,800,000 and a splendid balance of trade in favor of this country.

In not a single month this year have exports failed to show a gain from the corresponding month of last year. The same is true of imports, although the gains under that head have been narrower. Manufactured goods formed the largest item of both exports and imports. Europe continued the best customer of this country despite abnormal conditions there. Other North American countries absorb the next largest amount of United States goods, with the Orient third, and South America, Oceania and Africa following in the order named.

Americans Can Compete Successfully

The problem the American manufacturer meets because of higher labor costs, etc., in comparison with cheap production costs in Europe particularly, was discussed by Gerald Swope, president of the General Electric Company, of New York, who said foreign nations are working to extend their trade, thus making it important to the United States to take prompt, energetic steps to maintain its position in the export field.

"The foreign nations very much more than we," said Mr. Swope, "must depend to a large extent on their foreign business. Where the large industries in this country do 93 per cent in the United States and 7 per cent outside, the industries abroad, many of them, do 7 per cent in their own territory and 93 per cent without.

"Those nations, therefore, must make every endeavor to regain their foothold in the foreign field.

"It is a difficult question how we are going to meet that with the standards of living and the higher wages we pay in this country.

"First, you know that generally the cost of living has increased approximately 65 per cent. In 13 years' time, from 1912 to 1924, inclusive, the number of workmen in our largest factory has increased 15 per cent; wages of workmen (income per year) has increased 100 per cent, so their income, you see, has gained more rapidly than the cost of living. These two figures in themselves, the fact that the number of men increased 15 per cent in thirteen years and wages doubled, are significant along another line, because if the immigration policy we have now established is maintained—and it seems to me it will be—we must do what we can to increase the output per working man. We must do with a less number of people and increase their productivity."

Says Buses Will Eventually Replace Trolleys in Cities

IN discussing the relation of automobiles and motor buses to traffic congestion, before the Washington Section of the S. A. E., A. W. S. Herrington, Chief Engineer, Engineering and Design Section, Motor Transportation Division, Q. M. C., U. S. A., spoke in part as follows:

"Economists have long been looking for the elusive saturation point in the consumption of motor vehicles in this country Most of these studies have been based upon an estimate of the number of people who possessed enough money to buy a car. It is more probable that some approach to a saturation point will be found in an estimate of the available road space we have upon which to operate motor vehicles.

"The production of the industry for one year, 1923, would place upon our roads a greater mileage of single line moving traffic than there were miles of Federal Aid Highway constructed from 1917 to 1925, or a period of eight years.

"It will be economically impossible to change our congested areas within a short period of time to such an extent that our traffic problems will disappear. The only alternative is to use our available space more efficiently until other factors in the problem balance out.

Traffic Problem Grows

"The time is not far off in my opinion when certain sections of cities like New York, will be closed entirely to the privately owned and operated automobile and taxicabs used as a means of transportation in those areas. The trolley car operating upon steel rails in the center of the street, holding up all traffic behind it, is one vehicle that must be eliminated from our business districts and the more efficient and flexible bus service substituted.

"Many have been deluding themselves into believing that the bus is a good feeder to the outlying ends of their rail transportation system, whereas the economic place for the bus is as a transportation medium in the congested areas feeding to traffic out to those points where the greater speed of the railed system begins to give it the advantage.

"The bus is the means that will handle the congested short haul down town traffic and will feed it out to the more rapid interurban rail transportation lines serving outlying districts at high speed over private right of way, which are not situated upon streets designed for the use of other forms of transportation. There is no competition and there can be no competition between these two forms of passenger transportation.

Tests Show Fuel Supply Requirements for Acceleration

Impoverishment of mixture on quick opening of throttle is shown to be due to the fact that some of the fuel enters the cylinders as flowing wall film which must build up before delivery increases.

By P. S. Tice

THE work of designing a carbureter capable of giving the utmost performance from every point of view resolves itself into development along two chief lines: (a) means of controlling the mixture proportion so that it is kept at approximately the most economical value, except when maximum output is demanded; and (b) independent means for supplying suitable excess quantities of fuel during acceleration.

In fact, the mechanism of carburetion as we use it today is such that item (a) is of practical use only when highly developed mixture control during acceleration is coordinated with it. The assertion may well be made that the point of departure in modern carbureter design is the means for suitably modifying the mixture during acceleration.

Experimental examination of mixture supply systems shows that the two chief components—the carbureter and the manifold—are not fundamentally the best example of efficient team work. The fact is that there is always some fumbling of the pass in the intake, and the longer the pass the more embarrassed becomes its recipient.

The fuel in the mixture traverses the intake in three conditions: A portion of it is vaporized and mixed with the air; some of it is entrained in a finely divided liquid state, and the remainder forms a wall film that travels in the direction of gaseous flow. The distribution of the fuel gives rise to no difficulties (from our present point of view) so long as the rate of mass flow of the charge is not changed too much or too quickly.

Try This One Yourself

A striking illustration of the behavior of a liquid film in an intake manifold under the conditions of throttle manipulation is had if one considers an inclined strip of metal whose surface is wetted by a liquid caused to drop upon its higher end, and from whose lower end the liquid drips after traversing the length of the strip (Fig. 1). Suppose the liquid to be supplied at a steady rate until equilibrium is established, i.e., it falls from the lower end as fast as it falls upon the upper. If now the supply is changed to a higher rate it is observed that the discharge does not increase at once; it does so abruptly after an interval. Likewise, having equilibrium of supply and discharge, if the rate of supply is reduced the discharge does not at once change correspondingly; it does so eventually and again becomes equal to the supply rate.

Here we have a demonstration of the fact that a given rate of discharge of a wall film requires a given depth of liquid in the film at the discharging end of the surface traversed. The instantaneous discharge rate is in no wise affected by the film depth at any other point along the length of the passage, or by the rate at which fuel is applied at the entrance, or by anything other than the depth of the film at the "jumping off" place.

Fig. 1—Experimental set-up for observing the flow of liquid along a surface

The experiment just described is so simple and the results obtained offer so striking a picture of the behavior of the wall film that it is suggested that the reader try it himself. With even a very small metal strip (3 x 0.5 inch), steeply inclined (45 deg.), it is easily possible for the rate of supply to become momentarily equal to several times the rate of delivery, and vice versa.

Clearly, the greater the length or surface area of the manifold (or of the experimental strip), or the lower the charge velocity (smaller angle between the strip and the horizontal plane), in proportion to the quantity of fuel the manifold is required to handle, the greater must be the relative quantity of liquid contained in the wall film.

After this experiment has been performed it will be agreed that it is indeed very fortunate that all of the fuel reaching the engine is not required to do so by way of the wall film. Some of it is entrained in the air stream, and some of it is vaporized and becomes an integral part of that stream; and these latter two portions are not subject to the delay just discussed, and therefore serve to

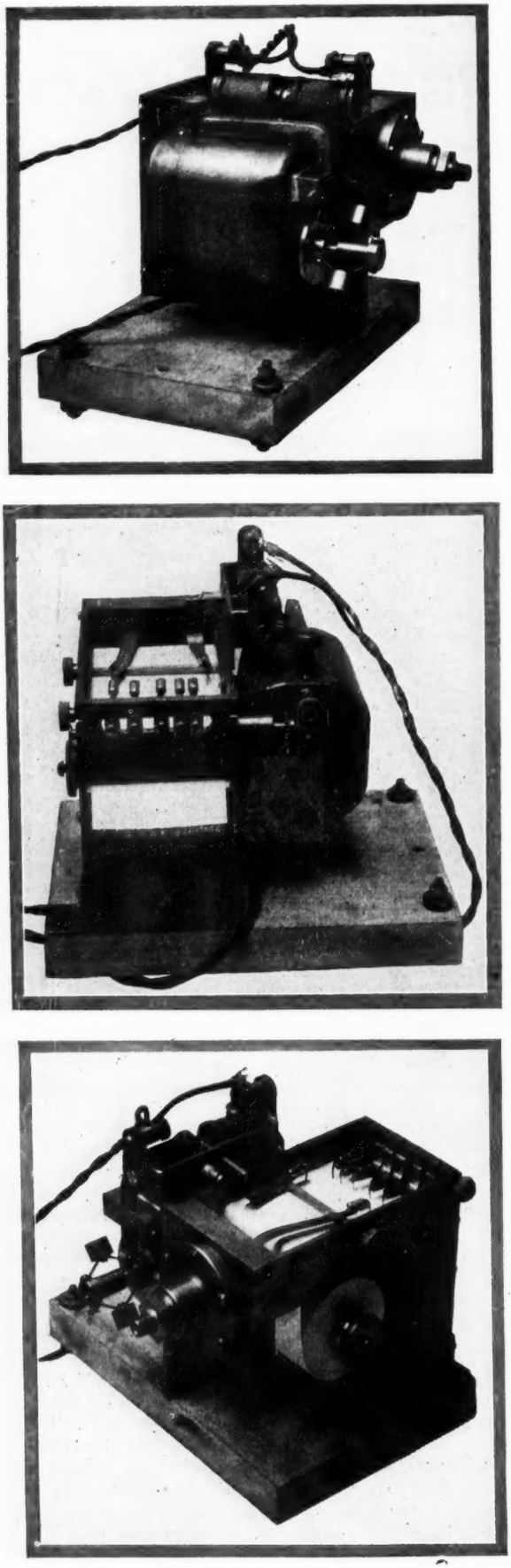


Fig. 2—The pressure, distance (or revolutions) and time recorder used in both laboratory and road work in studying the conditions modifying accelerations

reduce its effect upon engine performance. If all the fuel were vaporized or permanently entrained there would be no lag at all, and the intake manifold would at all times deliver to the engine mixtures of the same proportions as delivered to it by the carbureter. But this is Utopian, and will remain an unattainable ideal (like the air standard efficiency) until it is discovered how further to step up the intake velocities and further strongly heat the mixture without further reducing the volumetric efficiency. In other words, the wall film is with us and—so far as one can now see—is with us to stay, with every prospect of future growth as end points go higher (and "line eights" multiply).

General Order of Events

Without attempting to put things on a quantitative basis, since obviously, different cases are apt to be highly individual in their exact details, it is clear that the general order of events in the intake system, when an attempt is made to accelerate, is as follows:

(a) the throttle is opened somewhat, and as a result of this,
(b) the pressure in the intake rises. This results at once in
(c) a reduction of the vaporization rate in the intake, and
(d) an increased velocity of air flow through the carbureter, accompanied by only
(e) a comparatively small and unimportant increase in intake velocity. The increased air flow through the carbureter causes a corresponding increase in fuel discharge from the jets, and presumably the mixture proportion at the carbureter is altered but little, if at all (in the case of a simple carbureter without "accelerating well" or other similar device). However, simultaneously with the reduction of vaporization rate resulting from the rise in intake pressure, the chief spraying means in the carbureter, the throttle valve, ceases to function as such more or less, this resulting in
(f) a much impaired entrainment of fuel. Since relatively less fuel is now vaporized, and relatively less is now entrained, it follows that
(g) relatively more fuel is forced to go into the wall film, this in turn causing
(h) a considerably impoverished mixture to be delivered to the cylinders until such time as the film has built up to a suitable depth, as described earlier.

To Prevent Engine "Fainting"

This summary of events points the way for modifying the mixture proportion during acceleration: to keep the engine from "fainting," fuel must be supplied at a rate over and above that normally required by the greater air flow through the carbureter. How much extra fuel must be thus supplied, relatively, depends upon: (1) the magnitude of the acceleration in terms of change in relative air supply to the engine; (2) the intake velocity; (3) the intake temperature; (4) the richness of the steady running mixture; (5) the rate at which the excess fuel is introduced; and (6) the manner of its introduction, whether chiefly entrained or as wall-wetting fuel. These factors represent the important variables in any one installation. Of course among different engines there are the additional factors of manifold length and volume (compared with the displacement of the engine), and variations of shape and velocity affecting the entrainment of fuel and the equality of distribution.

A rather lengthy and complete laboratory examination of the inter-relationships of these quantities, supplemented by a series of observations on the road, has been made with the aid of the recording apparatus shown in Fig. 2. This latter makes automatic records of intake pressure, engine revolutions or distance, and time. The magnetically actuated pen toward the top of Fig. 2 traces a line in which a jog occurs at each ten engine revolutions (in the laboratory) or each 0.005 mile (on the road); the paper strip is drawn under the pens at the rate of 5 in. per minute by a small, closely governed electric motor geared to a toothed driving roller; the long pen arm is actuated by a spring-backed diaphragm, to one side of which the intake pressures are communicated; and the group of pens at the right trace pressure calibration lines, as required by the work in hand, over the trace made by the pressure pen. In analyzing a record from this apparatus (several examples of which are given in Fig. 3) a transparent celluloid template with engraved time scale is used, making it possible to read 0.10 second directly, and estimate to 0.05 second. This apparatus eliminates the personal element and thereby simplifies and much shortens the time consumed in a study such as that under discussion; and its use results in data whose accuracy are of a relatively high order. Also, and obviously, a record taken from it constitutes a detailed history of an acceleration, from which the effect of individual changes in significant specification factors, as those listed in the paragraph just preceding, can be determined with considerable exactness.

Quantity of Extra Fuel

From the results of the work that has been done in this study of acceleration the following general conclusions are drawn, with respect to the relative quantity of extra fuel that will assure the strongest response from the engine:

(1) The greater the magnitude of the acceleration the greater the quantity of "accelerating fuel" required. This relation is not one of direct proportionality, but is of the general order shown in Fig. 4.

(2) The lower the intake velocity (or pressure) from which maximum acceleration is made, the greater the relative quantity of extra fuel required. For partial accelerations, not to exceed 75 to 80 per cent of the relative air, the intake velocity is not very important. This follows from the fact that in full accelerations much of the extra fuel goes into the wall film, while in partial accelerations relatively more of it is entrained.

(3) The intake temperature has comparatively very little effect upon accelerating fuel required, above about 90 deg. F. Below this value more fuel is needed.

(4) For strongest response the extra fuel needed is approximately inversely as the richness of the steady running mixture from which acceleration is made.

(5) The rate of introduction of the extra fuel is important and, it seems, can rarely, if ever, be made too high. The more rapidly it is introduced the less is required, under all accelerating conditions.

(6) While it is true that the wall film must be built up rapidly in accelerating, no special provision need be made to cause the extra fuel to participate in its upbuilding. As much of it as possible should be entrained, since by this means the quantity needed can be materially reduced.

The thing to be aimed at in this phase of carbureter design is to supply under all conditions of acceleration the

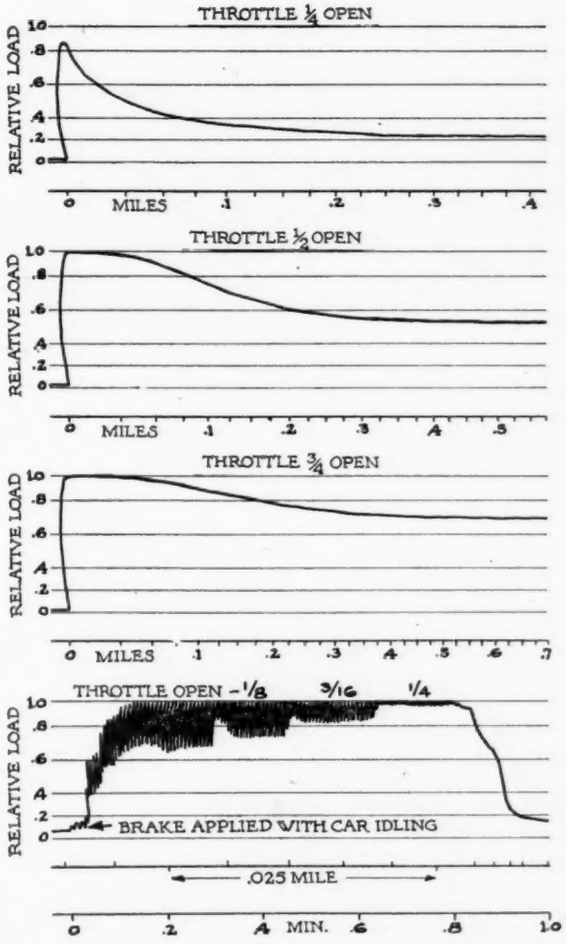


Fig. 3—Typical records of accelerations from 5 m.p.h. on a level concrete road. The lower record was made by braking an idling four-cylinder car to a speed at which each engine impulse caused the car to lurch strongly, the throttle then being opened in successive stages, without braking, until the car came out of it

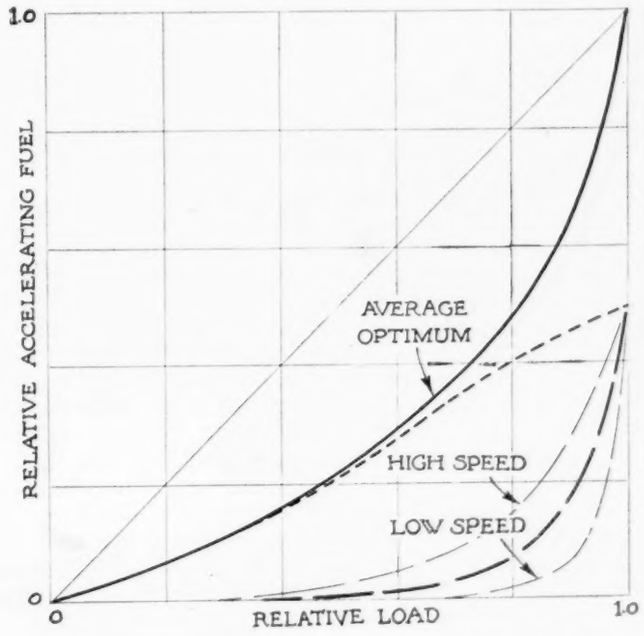


Fig. 4—The average optimum relation between quantity of accelerating fuel, for maximum response in accelerations, and the relative load on the engine. This applies, of course, only to the case of a carbureter serving the engine with mixture after the manner of the optimum curve a-d-c of Fig. 7

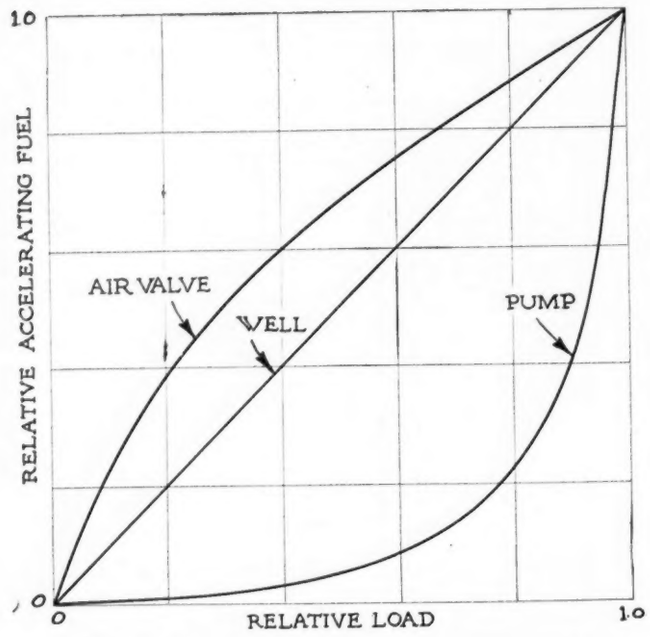


Fig. 4a—General behavior of several accelerating arrangements, ordinarily employed in carbureters, when acceleration is made from and at comparatively low engine speed

least quantity of extra fuel that will (or can be made to) result in maximum response. And this trimming down of the accelerating fuel is not done solely because of instinctive miserliness. The fuel on the walls, for reasons explained, lags behind during acceleration unless extra fuel is supplied; and during deceleration immediately following acceleration it lags hopelessly behind and is present in great quantity, with no place to go but where it is least needed—into the cylinders. For this reason, if for no other, the accelerating extra fuel must be supplied as sparingly as possible, consistent with the strongest response by the engine.

A man driving a late model feels that he is entitled to experience the wonderful vim that is at times attributed to his make of car, and in the same car and at the same time that he is enjoying its vim he feels that he is entitled to experience the really good fuel mileages discussed at other times. Whether these two experiences are obtained together, or whether one can be enjoyed only in the absence of the other, depends entirely upon the carburetion arrangements. This aspect of the case was touched upon in the opening paragraph of this paper, and will be discussed more fully in the following.

Power Proportional to Air

It is quite generally known how the mixture proportion must vary to produce power with the least consumption of fuel, and also what it must be to produce the maximum of power without regard to fuel consumption. In any internal combustion engine the power that can be developed is proportional to the weight of air drawn in (Fig. 5); also at a given speed the weight of air drawn in is proportional to the pressure in the intake (Fig. 6); hence the power that can be developed at any given speed is proportional to the intake pressure. If the maximum possible intake pressure is taken as unity, and the minimum intake pressure at which the engine will idle is taken as zero, we have a scale of relative power or relative load, depending upon our purpose. Against such a scale is plotted, in Fig. 7, the mixture ratio values that experience shows result in minimum fuel consumption and in maximum power.[1] Naturally these ratio values are composites, since engines differing in details of design will have different optimum mixture proportions. However, in the general run of well designed engines these differences are not very great, and Fig. 7 may be taken as representing the general order of variation with sufficient accuracy for the present purpose.

The region lying between the two heavy line curves of Fig. 7 includes all the mixture ratios that can be used advantageously, and defines the limits between which the mixture can usefully vary at each relative load. Since the act of opening the throttle follows the desire or need for more power, it is obviously in order to so design the carbureter that the mixture will be of maximum power proportion at the maximum load; and will operate on leaner and therefore more economical mixtures with the throttle in intermediate positions. The approximately optimum change-over between maximum economy and maximum power mixtures is shown by the dotted downward swing of the upper heavy curve in Fig. 7. The light dotted curve, x-x, represents approximately the lean limits at which ignition is regular; and, correspondingly, the curve y-y represents the rich limits of regular firing.

It must be understood that changes in mixture of the order shown by the maximum economy curve are properly related only to the *relative* air flow, i.e., the pressure in the engine intake. The absolute quantity of air has no bearing on the case; nor has the angular position of the throttle valve. Figs. 8 and 9 will help to make this clear. In the former it is seen that a given quantity of air may represent anything from full load to a small fractional load, depending upon the speed. Fig. 9 shows that a given throttle position may mean almost anything

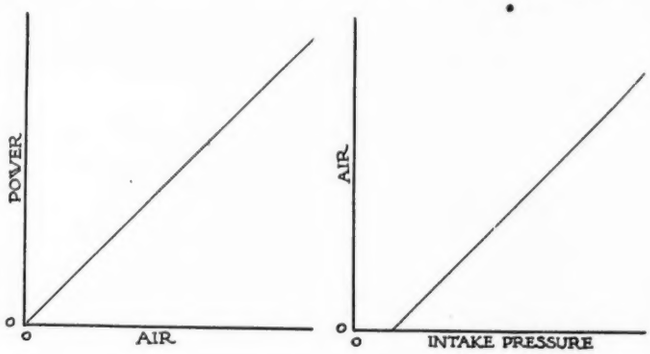


Fig. 5 *Fig. 6*

Fig. 5—Dependence of power output upon quantity of air aspirated by an engine
Fig. 6—General relation between air pumped and intake pressure (absolute) at a constant speed. The displacement of the origin is caused by residual combustion products

in relative air, depending upon the speed. The records of Fig. 3 include additional data on these points.

Let us assume that we have a carbureter that delivers at all speeds mixtures related to the relative load as shown by the optimum curve a-d-c in Fig. 7a. Use of such a carbureter will result in the highest possible economy over 80 per cent of the load range, and also in the development of maximum possible power when this is demanded.

In Fig. 7a it is attempted to show graphically what happens to the mixtures delivered at the cylinders when a carbureter as just described, and also capable of adjust-

1. Properly speaking, the optimum mixture (for economy) does not vary with the intake pressure at all, but chiefly with the extent of the dilution of fresh charge with residual combustion products. But since the dilution bears a very nearly straight line relation to the intake pressure, it is convenient to use the pressure as a basis, as it is a directly measurable and usable quantity.

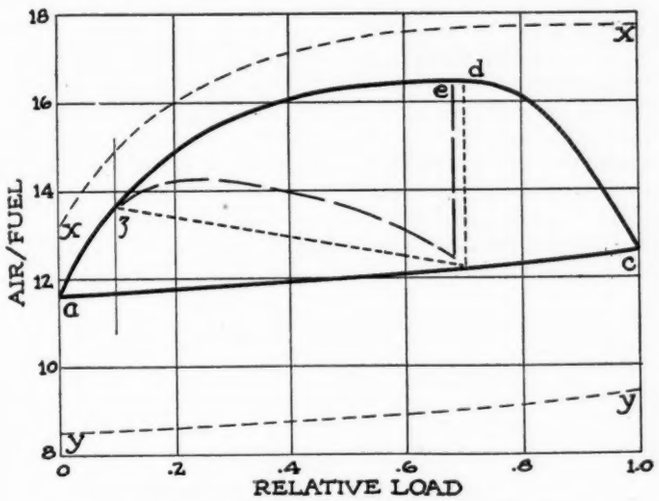


Fig. 7—How the mixture proportion must vary with load to give least fuel consumption (a-d-b), maximum power (a-f-c), and the most useful transition from one to the other (a-d-c)

ment to deliver mixtures as per curves a-e-c and a-f-c, is operated quickly from a small load to full load without extra or accelerating fuel. The several dotted curves originating on the 0.10 load line represent the general nature of the change in R at the cylinders. The air flow goes to its full load value practically instantly; the mixture becomes leaner rapidly, and continues to do so for some time after full load air is flowing. It is practically impossible to evaluate the intermediate or the peak Rs with any degree of accuracy in such a series, except in the case where the peak value is only slightly above the curve x-x, the limit of regular combustibility. While I have done the best I could with them, it must be kept in mind that the Fig. 7 series of "what happens to R" curves is offered as qualitative and illustrative. In any case, under the conditions supposed to obtain in Fig. 7a, the entrainment and vaporization are so reduced, and it takes so long for the wall film to build up, that the delivered mixture goes 'way beyond combustible proportions and remains there for some time, unless the general mixtures are made much richer than the optimum.

The supplying of accelerating fuel operates to maintain more fuel in entrainment and to build up the wall

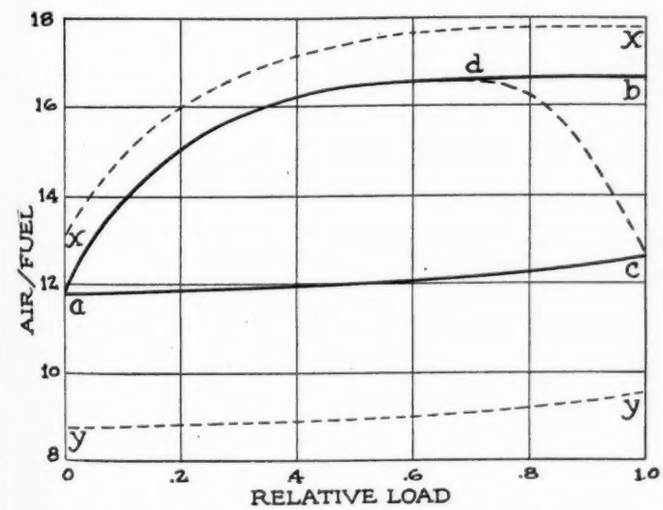


Fig. 7b—The probable mechanism of over-richness in partial accelerations when conventional accelerating fuel controls are arranged for rapid discharge of enough fuel for full accelerations from lean steady running mixtures

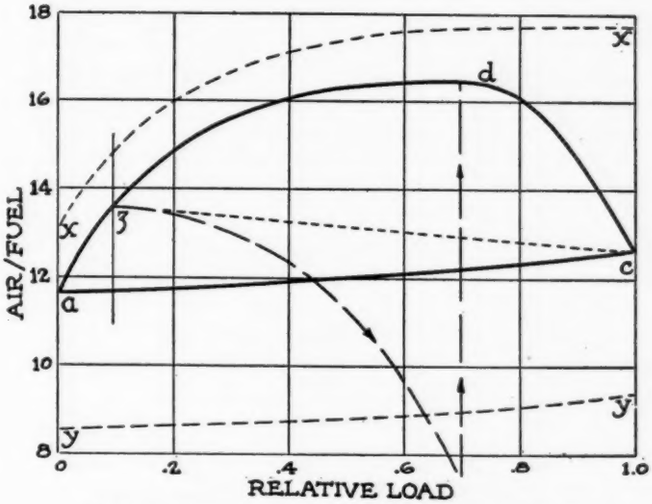


Fig. 7a—An attempt to show the variation in the effective mixture delivered to the cylinders in acceleration when a carbureter without accelerating full supply is opened up. In this diagram and in Fig. 7 the greater part of the time over which the changes in R are spread is consumed along the load line representing the value of load to which acceleration is made

film more rapidly. If enough of it is supplied quickly enough the delivered mixture can be kept within limits that result in steady and strong response throughout an acceleration to full load, with all steady running done on curve a-d-c. This is illustrated in Fig. 7b by the dotted line originating at *z* and connecting with *c*. In such a

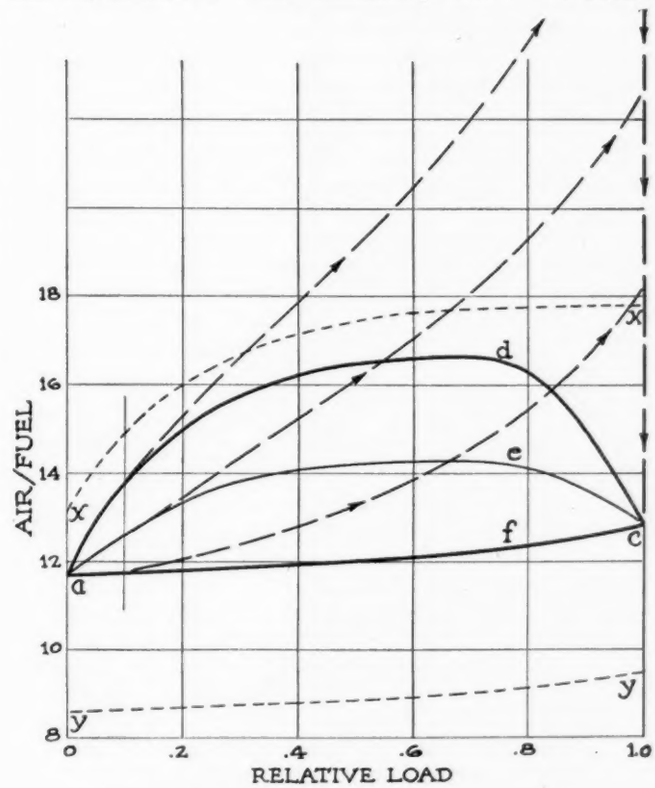


Fig. 7c—Optimum accelerating mixture variation (effective at cylinders), closely approximated with extra fuel supplied as in Fig. 4a in a carbureter following a-d-c, Fig. 7, in steady running. In most accelerations, where the relative load changes after the manner of the upper record in Fig. 3, rapidly reducing after attaining a fairly high intermediate value, the probable total change in R will be of the order shown by the dashed curve originating at z and ending at f

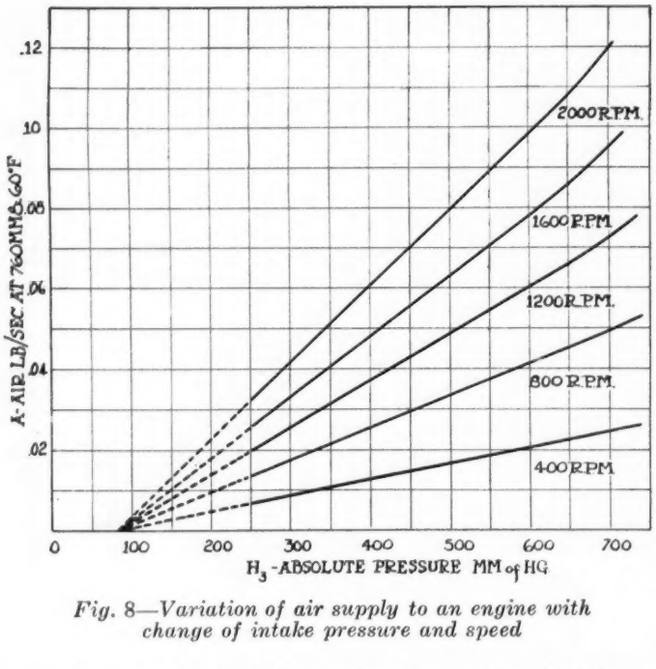


Fig. 8—Variation of air supply to an engine with change of intake pressure and speed

case about one-half of the accelerating fuel needed is accounted for by the lack of entrainment under the condition of comparatively poor spraying at open throttle.

Suppose that instead of the throttle being opened fully, such a carbureter so supplied with accelerating fuel is operated to accelerate to about 0.70 load. The data of Fig. 9 show that the angular motion of the throttle to accomplish this is only a fraction of its full throw, and that the throttle remains in a position which assures the entrainment of a much greater proportion of the total fuel supplied. It is a matter of common experience that under this combination of conditions the most widely used types of accelerating devices cause "gobbing"—that is, an over-supply of fuel sufficient to make the engine "soft" or even skip for a time. What happens is approximately indicated by the dashed line originating at *z* in Fig. 7b. The usual practical remedy for this is a combined enrichment of the steady running mixtures to reduce the amount of fuel necessary for full acceleration, and a damping or reduction of the rate of discharge of the accelerating fuel to such a degree that "gobbing" does

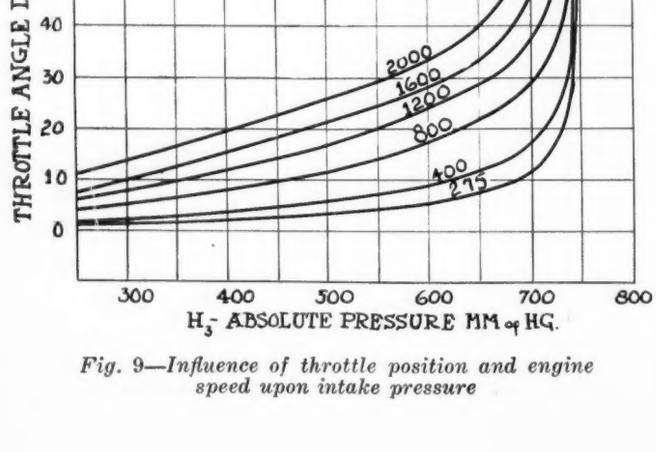


Fig. 9—Influence of throttle position and engine speed upon intake pressure

not occur, while the ability to respond steadily on full accelerations is retained.

It is in the nature of things that some such compromise must be made in a carbureter having a single source of accelerating fuel; it always results in greater fuel consumption than is inherently necessary; and the longer or larger the intake compared with the engine displacement, the more is economy compromised.

The real seat of the trouble is that the accelerating fuel controls in present day carbureters follow one or other of the tendency curves of Fig. 4a.

If the air valve constitutes the sole accelerating equipment it must be lightly damped and lightly loaded, if considerable fuel waste during acceleration is to be avoided. (The averages of a great number of records made with the apparatus of Fig. 2, in city driving, show that in comparatively free and open going the best and steadiest drivers employ the equivalent of from 7 to 9 full accelerations per mile when keeping within the speed limit. The faster the driving the more and stronger the accelerations per mile traveled. The best possible driving in heavy and comparatively slow traffic will require the equivalent of from 18 to 25 full accelerations per mile. The records of Fig. 10 are typical of these conditions.)

As distinguished from the air valve, which requires small damping to prevent notable over-richness in accelerations, the pressure (or suction) actuated well must be considerably damped to accomplish the same result. In both cases, in partial accelerations, relatively great quantities of fuel are applied relatively slowly, and are absorbed as over-rich mixtures still capable of combustion. The positive pump interconnected with the throttle spindle, if its capacity is only great enough for best performance in full accelerations, does not apply enough fuel on partial accelerations and it therefore imposes running mixtures considerably richer than the optimum. In the fuel level displacement type the accelerating fuel supply can be made to serve quite well on the smaller partial accelerations, but on the larger and full accelerations it is notably deficient and requires that the general steady going mixtures be kept fairly rich to insure strong response.

Many Arrangements Workable

Almost any arrangement that supplies extra fuel upon acceleration is workable if lowest average fuel consumption, cleanest combustion chambers, and maximum possible response in accelerations are not particularly sought or are not required simultaneously.

As a final supposition let it be assumed that accelerating fuel is supplied after the general manner of Fig. 4 and that the rates of supply are of the same order as the changes in relative load (intake pressure). Returning to the Fig. 7 series of diagrams, the change in R will then be of the order shown by the dotted curve z-d in Fig. 7. Upon accelerations from whatever point on the optimum curve the mixture at once changes to the maximum power value and then recovers to the optimum value for that relative load to which acceleration has been made. This, of course, represents an ideal state of affairs that cannot be exactly realized, since at best the rate of travel of fuel in entrainment is less than that of the air carrying it. However, the work that has been done lately shows that it can be approximated. The mixture can be enriched somewhat less rapidly to a close approach to the maximum power proportions in all accelerations, with rapid subsequent recovery to the optimum value as related to the then relative load, somewhat as per the dashed curve z-l, Fig. 7c. All that is required for this is refinement of accelerating fuel control, of the general order

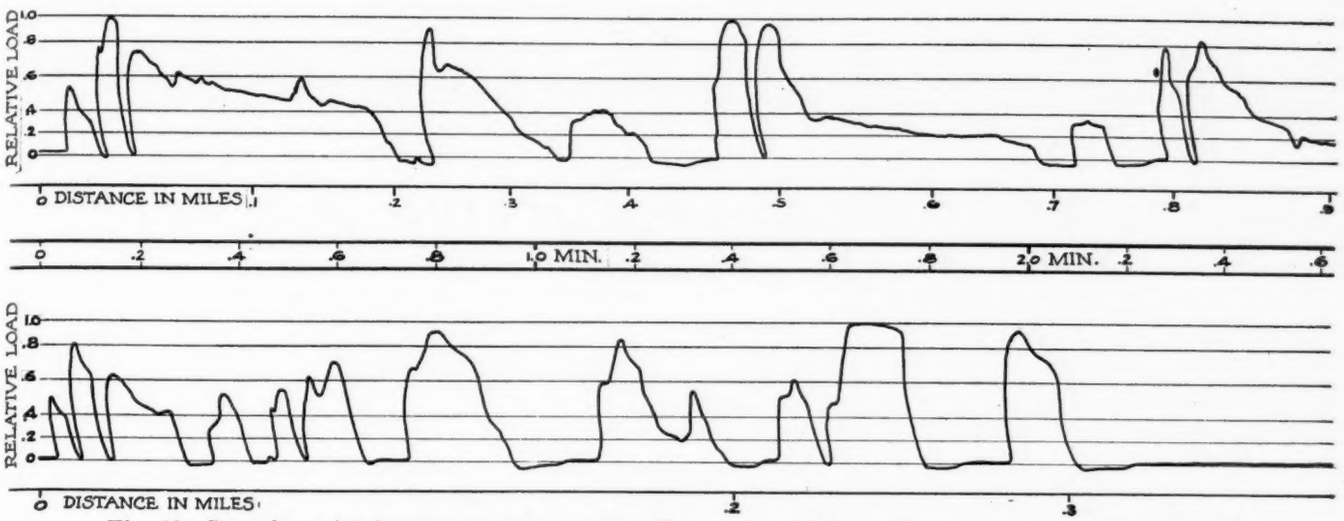


Fig. 10—Records of intake pressure changes in ordinary city driving. Above is a representative record of comparatively free and open going; and below is one made in close traffic. The latter is entirely high gear work, the car speed at no time going below 7 m.p.h.

of Fig. 4, arranged for highest possible rates of supply of fuel, applied to a carbureter whose general steady going metering characteristic follows the optimum quite closely.

In the carbureter based on this experimental work, the accelerating fuel is handled by two diaphragm pumps, one of them actuated by the intake pressure and therefore supplying fuel in proportion to the relative load, and the other mechanically actuated throughout the latter 75 to 80 per cent of throttle spindle motion. This latter pump ordinarily handles about one-half of the total accelerating fuel, and its chief function is to apply that portion of the accelerating fuel that so largely goes into the wall film upon full acceleration. The discharges of these two pumps are indicated in Fig. 4, the dotted line representing that of the pressure-actuated diaphragm, and the dashed line that of the mechanically actuated one. This latter cannot properly be shown against a relative load scale (see Fig. 9) by a single curve, the effect of speed being to shift the origin and lower portion of the dashed curve to the right as the speed is reduced and to the left as the speed is raised. The general result of this combination of the two is to make the curve of total accelerating fuel tend to straighten out somewhat in the mid-load range as the speed is raised. This supplies somewhat more fuel on partial accelerations at the higher speeds as compared with the lower, without affecting the maximum full acceleration quantity, which is the same for all speeds.

Up to this point it has been tacitly assumed that a definite quantity of fuel (as extra supply) is needed for an acceleration of a given magnitude from a given relative load, no matter what the engine speed at that relative load. This assumption is almost completely justified by highly refined performance measurements. The explanation is that as the intake velocity is raised, at a given relative load, the entrainment is improved to such an extent as to substantially offset the apparent requirement of a greater quantity of accelerating fuel when more mixture is flowing. That is to say, having developed the accelerating fuel control for best performance from and at comparatively low speeds, in a carbureter having relatively high entrainment there is no practical need for provisions to supply greater absolute quantities of accelerating fuel to accomplish a like effective enrichment at higher speeds. It must be noted, however, that at least the same amount of accelerating fuel is required at the higher as at the lower speeds.

Suggestions for the Development of the Bureau of Standards

IN a report to the Secretary of Commerce the Visitors to the Bureau of Standards make several recommendations for extensions of its work and improvement in its equipment. One recommendation is to the effect that a suitable building be provided at some railroad center like Chicago for the railroad master scale which was purchased by the Bureau some years ago. As the freight charges on some 3½ billion tons per year depend for their accuracy and equity on this scale, it is argued that the necessary investment of about $50,000 would be well justified.

The power plant of the Bureau was built when the institution was only half its present size and is entirely inadequate. It is also felt that the power plant of such an institution should be a model of modern practice in the provision of heat and power to a group of buildings. Estimates by the Bureau indicate that such a power plant might be installed for from $200,000 to $250,000, and the Visitors consider it very desirable.

Another recommendation made, that the Government purchase and hold for future Bureau growth the land between the site of the Bureau and Connecticut Avenue, has already been given effect to in that Congress made the necessary appropriation and the land was purchased, making the present site equal to 43 acres.

The Board of Visitors consists of Wilder D. Bancroft, professor of physical chemistry in Cornell University; Gano Dunn, president of J. G. White & Co.; Dr. Wm. F. Durand, professor of mechanical engineering, Leland Stanford University; Dr. Samuel W. Stratton, president of Massachusetts Institute of Technology, and Ambrose Swasey of the Warner & Swasey Co., Cleveland, Ohio.

Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

New Spanish Customs Rule

THE Bureau of Foreign and Domestic Commerce is informed that after June 1, 1925, Spanish importers of foreign merchandise are required to present, at the time of clearance of their goods through the customs-house, the original invoice with a copy on plain paper on which the name of the seller and purchaser may be omitted. After the copy has been checked with the original invoice, the latter will be returned to the person concerned or his agent, and the copy will pass to the appraisement officer. The invoice and its copy are to be considered confidential and for the exclusive use of the appraisement office. For failure to present the original invoice and its copy, as prescribed in the order, a fine of 5 per cent of the total amount of the duties, which shall in no case be less than 25 pesetas, shall be levied by the customs officials.

London Opposes 2-Seater Cabs

ON account of the success of 2-seater taxicabs in Paris and other Continental European cities efforts are being made on the part of several London firms to introduce them into service there. Before a taxicab can be operated in London, however, it is necessary to secure a license from Scotland Yard, which up to the present has refused to license this type of vehicle. The Scotland Yard contention is that if the 2-seater cabs were adopted present traffic congestion would be increased, and statistics already show that there are 8,043 taxicabs in use in London with ranks sufficient to accommodate only 5942. Present owners of taxicabs through the Motor Cab Trade Protection Society are also violently opposing any efforts to introduce the 2-seater type.

Motorcycle Exports Slump

FOREIGN markets for American motorcycles have not displayed as great absorptive powers during recent years as has been the case with American cars and trucks, observes the Automotive Division of the Department of Commerce in an analysis of the factors which have affected motorcycle exports. Motorcycle exports from the United States during the six-year period, 1913 and 1920 to 1924, have exhibited a pronounced variable trend. The volume of these shipments amounted to 3983 units in 1913, 37,622 in 1920, 11,001 in 1921, 15,976 in 1922, 22,112 in 1923 and 16,859 in 1924, inclusive; the yearly average of exports was almost 21,000 units. Exports during 1924 scarcely went over four-fifths of this five-year average. On the other hand, exports of passenger cars and trucks from the United States during 1924 were well above their five-year average, amounting to 146 per cent and 124 per cent respectively.

Increasing competition from European producers, principally the British motorcycle industry, which made great strides during 1924 in developing its export markets, has no doubt been the greatest single factor in keeping American motorcycle exports confined to this small volume. Over the six-year period, Australia has been the outstanding foreign market for American motorcycles, standing first in 1922, 1923 and 1924, third in 1920 and 1921 and twentieth in 1913. The Netherlands were just behind Australia as a market leader, accounting for first place in 1921, second in 1920, 1922, 1923 and 1924 and only failed to place among the twenty leaders in 1913. Sweden made a very good record as an export market for American motorcycles during the six-year period, only falling below Australia and the Netherlands in point of sustained leadership.

A Demand for Rail Cars

FOR the benefit of automotive manufacturers who are desirous of bidding on equipment needed in Colombia, the Automotive Division announces that the Sabana, Girardot and Antioquia railroads have been required to furnish auto-cars to run on their tracks for the purpose of conveying mail as well as passengers from the air line.

"It is understood," says the Automotive Division, "that the Girardot Railway has been negotiating for these cars with a German concern. American manufacturers who are interested in quoting on this style of equipment should communicate with Ferrocarril del Antioquia, Medellin, sending prices as well as descriptive literature and full details."

Copenhagen-Paris Bus Line

A MOTOR bus service between Copenhagen and Paris has been inaugurated, says a cable dispatch received by the Department of Commerce. The project is being undertaken by the Danish representative of an American cab company and the bus in question, while built in the Danish automobile factory, has the regular engine and chassis of the American cab. The bus will accommodate 12 passengers and the trip will require five days.

U. S. Buses in New Zealand

THE City of Wellington in New Zealand has placed an order for the purchase of one American bus complete, together with five bus chassis which are to be used in competition with bus lines to be operated by private enterprises. The bodies for the five chassis are to be built locally. All these buses will be employed as adjuncts to the municipal street car system. Imports of motor vehicles into New Zealand for 1924 numbered 18,633.

State Registration Data Do Not Give True Picture of Cars in Use

Comparison of cars registered with sales records of individual companies show major inaccuracies. Better methods would benefit States as well as industry.

By John W. Scoville
Chrysler Motor Co.

THE possibility of obtaining accurate registration data has increased every year. As the automobile has become an increasingly important producer of revenue for the various States, more detailed records concerning it have been installed. But even today, major inaccuracies can be traced in the registration practice of many States which result in:

1. Loss of revenue to the State
2. Inadequate records for tracing stolen or lost cars
3. Inaccurate quotas for dealer territories
4. Incorrect factory estimates of sales, resulting in improper production schedules

Present registration statistics, it is true, are sufficiently reliable to be of immense value to both factories and dealers. There is great room for improvement, however, especially in certain States—and improvement would benefit not only the automotive industry but also the exchequers of the States involved.

The first step in seeking improvements is to discover specifically what faults are inherent in the present methods. This can be done by analysis of a few typical cases.

Registration figures are of two kinds:

1. Total registrations, which approximate the number of cars in use
2. New car registrations, which approximate the new car sales

Total registrations are secured in two ways:

1. By counting the license plates issued by the State registration bureau
2. By counting the names of automobile owners as furnished by companies that supply mailing lists

Some License Plates Lost

It is not certain that all license plates issued by a State become attached to an automobile.

Some plates are lost, misplaced or destroyed. Some owners fail to get new license plates. Many automobiles are registered in two or more States. Many cars registered in the year are destroyed before the end of the year.

For these and other reasons, the number of cars registered during a year differs greatly from the number of cars in use at the end of the year.

To check the accuracy of the total registration figures, the State count of an automobile manufactured for the first time in 1924 may be compared with the factory sales of this car by States.

In Missouri, Illinois, Indiana, Ohio, Washington, Alabama, Maryland and Connecticut less than 25 per cent of the sales made from the factory appeared in the Dec. 31, 1924, count furnished by the listing company. To be sure, some of the cars sold by the factory were still in the hands of dealers. But this number would amount to less than 15 per cent of the factory sales.

Over 4000 cars sold in the eight States mentioned did not appear in the 1924 count.

In 24 States the Dec. 31, 1924, count of this particular car accounted for not more than 50 per cent of the factory sales. If mistakes of this magnitude are being made in automobile registration statistics for one car, they are being made for other cars, and the registration totals may be less accurate than we suspect.

Similar inaccuracies appear when check is made of a car that has been on the market for over ten years.

Cars Sold and Cars Registered

The number of cars in use have been estimated by adding the sales made from the factory to a given State over a period of six years. This total was then compared with the number of cars registered in 1924, as furnished by a listing company.

Louisiana, Alabama, Georgia, Tennessee and North Carolina gave registrations which were less than 75 per cent of the sales made in six years.

On the other hand, California, Oregon, Arizona, Texas, New Mexico, Montana, Wyoming, North and South Dakota, Nebraska, Kansas, Iowa, Minnesota, Wisconsin, Oklahoma, Maine, New Hampshire, New Jersey, Indiana and Maryland showed 1924 registrations to be more than 130 per cent of the sales made in six years.

It will be noted that nearly all western States show an excess of registrations over the sales made in six years, indicating probably a migration of cars. Many vehicles sold in the East probably have been driven West and, through the sale of the car or the change of residence of the owner, have remained there. The low registration figures for the Southern States may be due to the migration of cars or to incomplete lists of owners.

From the study of this second car we must conclude that either the car in question lasts more than six years, on the average, or the registration figures are inflated by from 10 to 15 per cent. The registration figures seem to be more accurate for a car that has been on the market for a period of years than for a car that has just been introduced.

It is obvious that the number of American cars scrapped in 1923 was equal to the number of cars registered

1923 plus the 1924 domestic production less the 1924 registrations plus exports. Applying this theory to a high priced car, we find that the number of cars scrapped in 1923 was about 19 per cent of the cars in use. This seems too great a loss for a car selling for $4,000. This method gives about 28,000 Buicks scrapped in 1923 and for Chevrolet a figure of 49,000 less than nothing!

This negative figure may be caused by changes in the field stocks. It is therefore impossible to check up registration statistics by this method without a knowledge of the changes in field stocks. However, fifteen makes of cars show a negative figure for cars scrapped in 1923. It would seem that no old cars wore out and that some old cars were resurrected! It is interesting to note that the increase in Durant registrations in 1924 over 1923 was more than four times the 1924 production.

How the Errors Occur

New car registrations are incorrect for various reasons. The license fee and record may be retained for several months by the local official, so that State headquarters get a delayed report of the sale. In many States, the license does not show whether a new or used car was registered, hence the new car registrations cannot be distinguished from the re-registrations. In some States cars are driven with old license plates. The license plate may be removed from an old car and attached to a new car. In 1924, the new car sales reported were more than 30 per cent below the actual sales made in Alabama, Georgia, Louisiana and Florida.

In the following States the new car sales reported were above the sales actually made:

Arkansas
Idaho
New Jersey
New Mexico

In New Jersey, cars bought in New York are being registered in New Jersey.

In Ohio, less than 80 per cent of the sales made get into the new car registration figures. In the following States the new car registration figures are probably more than 10 per cent below actual sales:

Missouri
Montana
New Hampshire
Washington
West Virginia
Wyoming

Many factories are using new car registration statistics to check up sales made at retail by competing dealers. An injustice is being done to the dealers in many States through the failure of the State authorities to secure accurate data on new cars registered and there is doubtless much loss of revenue in certain States due to defects in the registration blanks used, or to failure to administer the law.

While the registration of cars was introduced primarily as a revenue measure, the data obtained are so useful in tracing stolen cars, in running down criminals, in securing appropriations for highway construction and in measuring the results obtained by dealers who sell cars, that the whole automotive industry would be benefited by a careful study of the whole subject by the state officials in charge of registration.

New Rapid-Hardening Road Cement Used in England

BRITISH road engineers hitherto have been very reluctant to adopt concrete for road surfaces, and one, if not the principal, reason of late years has been the length of time needed to allow the concrete to harden before heavy traffic could be permitted to use the new road. But the interest in concrete roads has lately been stimulated to no small extent and stretches of this type of road have been or are being laid in many parts of England, owing to the introduction of a new rapid-hardening cement known as Ferrocrete. It is sold by the Cement Marketing Co., the sales organization of nearly all the cement manufacturers of England, and the claims made on its behalf, backed by authoritative and disinterested reports, are therefore put forward by people who are suppliers of cement of all kinds.

Ferrocrete was first introduced about eighteen months ago, and some of the first batches produced commercially were used in the London Borough of Southwark, a district on the south side of the Thames in which vehicular traffic is exceptionally heavy. So successful were the first streets to be repaved with concrete made with Ferrocrete cement that the road engineer of Southwark has made use of this material to an increasing extent and at the present time approximately ten miles of the borough streets have already been remade by this means. In several cases traffic has been using the road within 48 hours of the concrete being laid, an obvious advantage from every standpoint and one that has enabled some streets to be laid full width at once, instead of half width at a time with each half given from four to six weeks to harden before use, as in the case of concrete made with ordinary cement.

This new material is also in use in several other parts of England, the concrete being used both as a surface and as a foundation for tar-macadam, stone-setts, wood blocks, etc. In all cases its rapid hardening quality can be and has been taken advantage of. Westminster Bridge, crossing the Thames by the Houses of Parliament, has, for instance, recently been relaid with Ferrocrete cement as a foundation for the wearing surface.

Ferrocrete develops great tensile and compressive strength very quickly, and in one day, when mixed with three parts of sand, it has the strength required of ordinary cement by the British Standard Specification in 28 days. Although it is rapid-hardening it is slow-setting, allowing it to be manipulated, formed or distributed without undue haste.

As regards cost, Ferrocrete is rather more than ordinary cement, the ratio being as 78 to 65 (the respective prices in shillings per ton in England).

AT a recent meeting of the Association of Recognized National Automobile Clubs in Paris it was decided that the Grand Prize of Europe race shall be run in Italy in 1927 and in England in 1928. The Automobile Clubs of Italy, Austria, Switzerland and France will jointly organize an Alpine touring contest in 1926, which is likely to prove the most arduous test of this kind ever held. The International Sport Commission accepted the proposed automatic electric timing device which automatically records the time of a racing car to 1100 second. The Automobile Club of Germany was admitted to membership.

Americans Urge Broad View of Highway Development at Brussels Meeting

Europeans less enthusiastic about possibilities of cooperative effort. International Chamber of Commerce committee to study economic future of motor transport.

By W. F. Bradley

HIGHWAY economics figured prominently in the program of the third Congress of the International Chamber of Commerce, which came to a close in Brussels on June 24, thanks to the initiative of the American section and particularly by reason of the activities of Roy D. Chapin, chairman of the Highway Transport Committee.

That a nation whose road system has been developed within the memory of living men should call together the leaders of countries whose roads hark back to the cradle of civilization seemed to surprise the Old World, and as a consequence there was some indifference, tempered with just a little suspicion. Whether the roads were planned in the days of the Romans, or were rough staked by nineteenth century pioneers, the infinitely varied problem of their economic utilization is one which has arisen with the growth of the automobile, and it was on this basis that American action was taken.

Many Organizations at Work

Europe, and particularly the western countries of that Continent, has numerous organizations working on specific problems connected with highways and these bodies not infrequently displayed fear lest the International Chamber of Commerce should tread on their particular preserves. European automobile manufacturers have not yet been aroused to the importance of joint study and action on highway economics. Although approached personally, not a single representative of the French automobile industry attended the Belgian Congress, and although Henry Cézanne, general manager of the International Bureau of Automobile Manufacturers, was present, he was not empowered to speak on behalf of the French industry. The attitude seemed to be that highways are a heritage from the past and details concerning their utilization should be left to the various touring organizations and automobile clubs. That touring should be facilitated as much as possible is fully understood, but that there is any need for the automobile manufacturer to work on the broad question of highway economics is not realized by more than a very limited number.

Sir Arthur Balfour presided at the session devoted to Highway Transportation. The previous day the Sea Transportation section got itself into a tangle from which it was extricated with difficulty, and as a consequence the original program providing for three days to discuss road matters was cut down to a single morning.

Roy D. Chapin, who presented the report of the American Committee on Highway Transport, pointed out the world-wide interest of this question by reason of the extraordinary development of the use of the automobile. Truck and motor bus services, added to the many millions of private cars in use, have done more to transform social and economic conditions than any other development of the century and have raised new problems which need to be treated from a very broad standpoint.

Touching on the relation of railways to highways, the increased value of farm land by reason of improved highway transportation, international intercourse, measures to avoid accidents, uniform road signalling devices, taxation and road financing, Mr. Chapin concluded by pointing out that the use of the automobile was growing faster than our knowledge of its principles and of its future. A solid foundation should be laid for this new form of transport, established by thinking men who can foresee the wonderful possibilities and who desire that the development shall be in accordance with sound economic principles.

The discussion was divided into the following topics:

1. Financing of the highway.
2. Taxation of automobiles.
3. Study of commercial transportation.
4. Relation of motor transportation to other transport agencies.

M. Le Gavrian, general secretary of the Association Internationale Permanente des Congres de la Route, explained at some length the work of this body, and W. O. Rutherford, President of the Rubber Association of America, dealt with highway finances and automobile taxation. The study of commercial highway transportation was treated in an interesting speech by Colonel Hacking, of Great Britain, who gave examples of the recent development of long distance road trucking in the British Isles.

Private Automobile Roads

Private automobile roads was the theme taken up by one of the Italian delegates, M. Borriello. Northern Italy is interested in the construction of private automobile roads running from such commercial and manufacturing centers as Turin and Milan to supplement the present inadequate highways. Within the last two years private automobile roads having a width of 36 to 46 feet have been built from Milan to the northern lakes, giving a total length of about sixty miles.

Limited to automobile traffic, having no grade crossings, constructed according to the most advanced highway engineering practice, use of these roads may be obtained on payment of an annual subscription of 1350 to 2250 liras or of a small fee for a single journey. There is a project to build similar roads from Milan to Turin, the two most important towns in Northern Italy, from Turin

to Genoa, and eventually a roadway to Rome and Naples.

The Italian Government grants a franchise to the private company building the roads, it gives an annual subvention of one and a half million liras to the roads now in operation, and it takes possession of the roads after a lapse of fifty years.

M. Edmond Chaix, one of the French delegates, entered on quite another phase of the discussion by outlining the work of the International Touring Association, of which he is the president. Fearful lest the International Chamber of Commerce should overlap on the work being done by the body with which he is connected, and which concerns itself principally with touring facilities and international intercourse by private automobiles, he expressed the desire that the Chamber of Commerce should limit itself to trucks and motor buses.

Contrast in National Policies

An interesting contrast in national policies was revealed in the speeches made respectively by an English delegate, Mr. Thornhill, of the London, Midland and Scottish Railway, and by Mr. Pourceal of the French P. L. M. Railway Company. The English railroads not being allowed to operate motor bus services, this business is in the hands of private concerns, who not infrequently endeavor to operate in competition with railroad interests. Mr. Thornhill emphasized the disaster to trade if these great means of transportation should consider themselves as competitors rather than as collaborators.

In France the railroad companies are important users of motor buses, and in the Alps and the Pyrenees, in particular, they operate motor buses on a very extensive scale to supplement the inflexible railroad system. The French Line Steamship Company is working on a big scale in Northern Africa—Algeria, Tunisia and parts of Morocco—with long distance motor coach services penetrating into regions which are not yet touched by the railway. In both these cases railroad and automobile interests are the same.

Sir Arthur Balfour asked Mr. Chapin to propose the resolutions which, after a speech by Mr. Chaix, who expressed a desire to see the activities of the International Chamber of Commerce as regards highway transportation very clearly defined, were adopted as follows:

"The Congress of the International Chamber of Commerce, considering the important development of motor transportation during the last few years and the benefits which result from the well being of all peoples and the increase of motor transportation for commercial purposes, decides:

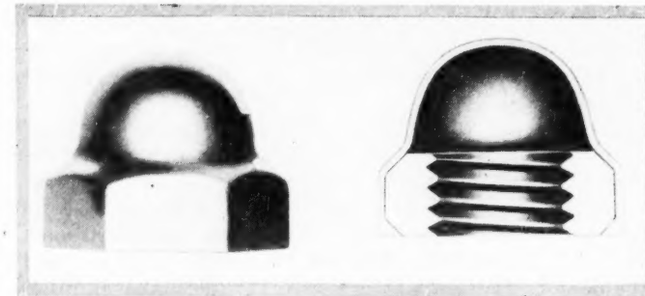
"To create a special committee charged (1) with studying from the economic viewpoint the best methods by which the motor vehicle can fullfill its object as a means of transportation; (2) with studying from the same point of view the relations between motor transportation and other means of transport."

Immediately after the Transport Session, Mr. Chapin entertained about one hundred delegates to luncheon at the Palace Hotel, Brussels, the meal being followed by the American film "The Highway to Happiness," which was shown, as Mr. Chapin took pains to explain, not with the idea that things were done better in the United States, but as an illustration of the difficulties which had been met with and how they had been overcome.

American representation at the transport session outnumbered that of any other nation. Among leaders of the industry, in addition to Mr. Chapin, who had just completed an extensive five-month automobile tour through Northern Africa and various parts of Europe, were John N. Willys, Stephen D. Briggs of the Chrysler Motor Corporation, and M. L. Hemingway, general manager of the Motor and Accessory Manufacturers' Association, who was starting out on a journey through Germany, the Scandinavian countries, France and England.

The commercial aviation section emphasized the essentially international character of commercial air services and the consequent necessity of international agreements to facilitate flying developments. Air mails were indicated as the most profitable branch of commercial aviation and the one which should be specially encouraged by the International Chamber of Commerce.

Private air legislation also was insisted upon as a subject for the attention of the Chamber. National laws concerning commercial aviation may contradict one another unless a general agreement be specifically concluded between the various States and, commercial aviation being essentially international, legal differences or discrepancies in this respect might hamper or even prevent its development.



Non-corrosive nut, in outside view and section

Non-Corrosive Acorn Nuts

A NON-CORROSIVE acorn nut as shown by the cut has been brought out by The Ferry Cap & Set Screw Co., Cleveland. It consists of a steel hexagon nut with a protective brass shell and is claimed to have the strength of a solid steel nut together with the advantage of taking nickel plating without any possibility of rusting. These nuts are supplied in brass, nickel-plated barrel finish, or nickel-plated, polished and buffed.

They are made 15/16 in. across flats and are carried in stock and furnished tapped ½, 9/16 and ⅝ in., for both SAE and USS threads. Any desired threading up to ⅝ in. can be supplied at additional cost. A smaller size nut, ¾ in. across the flats, will shortly be placed upon the market. These will come tapped to ¼, 5/16, ⅜ and 7/16 in. for both USS and SAE threads.

IN the course of a paper recently read before the Birmingham Metallurgical Society, R. Genders said that he saw no reason why ultimately iron and steel should not be treated by the extrusion process. At present, however, the high pressures necessary to accomplish extrusion caused great difficulties. The dies for 60/64 brass were usually made of tungsten or some other tool steel, although some works found it better to use carbon steel, and to renew the dies frequently. He had been informed recently that "Elektron" metal was successfully extruded through a 60-hole multiple die in Germany. Speaking of the inverted process, which was now being applied commercially, Mr. Genders claimed that, provided sound ingots were used, the production of internally unsound rod was impossible. A 1000-ton "inverted" press was being built.

THE FORUM

Highway Costs and Taxes

Editor, *Automotive Industries,*

In your May 21 issue appear two items regarding highway costs and taxes, under the headings: "Reeves Compares Car Taxes with Highways" and "Big Hoosier Road Bill." Both items deal with State and Federal aid, and point out how large a portion of these is paid out of motor taxes.

In discussing highway costs, it is well not to forget the large share paid by the counties and townships, all of which must be raised by general taxation. I do not have complete figures for 1924, but in 1921 a total of $1,036,587,772 was spent for all highway purposes by all political units of the states, including Federal aid. It probably exceeded $1,200,000,000 in 1924.

Indiana, which last year raised about $10,000,000 from auto owners for state road purposes, and contributed from the same source (by gasoline tax) $1,000,000 to the counties, spent in 1921 a total exceeding $44,000,000 on state, county and township roads, of which the counties and townships contributed about $36,000,000. These sums did not include interest and payments on previous bond issues, amounting to some $10,000,000.

Taking the country as a whole, motor vehicle owners as such are paying less than one-half of all the costs of the roads they use. The rest is raised by general taxation, either directly or through the issue of short term bonds, which will later be retired out of the proceeds of general taxation.

Naturally car owners are expected to bear their share of taxation for other things besides roads. For example, the Federal government raised about $160,000,000 last year by motor vehicle taxation (excise, etc.) In the same period, the Federal aid given to the States for road purposes was about $63,000,000. HERBERT L. TOWLE.

Oil as a Cushioner

Editor, AUTOMOTIVE INDUSTRIES:

D. M. Claydon is a very able and informed writer. His articles have always interested and impressed me because they are always so original—original in ideas and ways of expounding them.

I was, therefore, mildly startled in reading his second installment on "The Problem of Satisfactory, All-Year-Round Engine Lubrication," to find that he has strayed from his former inclinations and drawn conclusions that are decidedly commonplace.

I refer to his statement on page 866, second column, third paragraph, that an "oil performs two functions in the engine: It lubricates and it cushions." Why "cushions"? Mr. Claydon will, of course, find popular acquiesence in this assumption, but is this sufficient to warrant its acceptance as an undisputed fact?

Oil does seem to quiet the valve action when the engine is cold, but the same thing cannot be said of an oil when hot. The popularity of this assumption, however, is largely responsible for the use of very viscous oils by the uninformed with its accompanying trouble due to lack of distribution, excessive wear, carbon, gumming, etc.

The fact that viscosity curves of light and heavy oils approach one another at high temperatures does not seem to be taken into account in this theory of "cushioning" nor does it give consideration to other explanations that are more in keeping with recent research on the subject.

B. B. MEARS.

Delivered Car Prices

Editor, AUTOMOTIVE INDUSTRIES:

We have read with a great deal of interest your article in the May 14 issue, page 868, entitled "Delivered Car Prices."

While our company is not in the car business, the same would apply to us. We handle manufacturers' products and are known as one of the parts stations of the National Automotive Parts Association, recently organized in Detroit.

The thought comes to us that if a factory wants to do business in a certain locality, that factory should pay the costs of doing that business. In other words, it is not fair for a distributor of a product in New York, with the factory situated in New York, to buy and sell at the same prices as we would in Denver.

For instance, supposing we bought a carbureter which was manufactured in New York; we would get the same discount as the New York distributor, the resale price of this carbureter would be the same in Denver as it would be in New York, and we would have to pay the transportation from New York to Denver, thereby reducing our gross profit to a considerable extent.

It does not seem fair to us in the West that we should be discriminated against in this way. There are certain manufacturers that have a Western price, which takes care of the transportation problem; but there are many manufacturers who insist that their product be sold at the same price in the West as it is in the East, and that the transportation charges must be paid by the buyer.

We would like to see you get the opinion of some of the manufacturers and other concerns distributing products relative to this matter, as we believe some editorials on this will change the attitude of certain manufacturers who continue to carry out this policy, which has of late become a very aggravated one in this territory.

F. J. GALL,
The Gall Auto Specialty Co.

A SPECIAL automobile test track has been built between Berlin and Dannsee, a suburb. The test track consists of two parallel roads completed at both ends by a circle. It is known by the name "Avus" and was built by the automobile manufacturers and the city. When races or tests are held it is blocked for regular traffic.

Another use to which it is put is to produce advertising results for manufacturers. One manufacturer recently ran a 240-hour continuous test of his machine to prove the small wear in evidence under this terrific strain. Chauffeurs were changed every four hours on the fly and the results were freely advertised in the trade papers and German press.

85 Lb. Airplane Engine Develops 28 Hp.

Designed by H. E. Morehouse to sell at $595. Bore dimension larger than stroke. Dependability a feature. Air cooled.

By Athel F. Denham

A TWO-CYLINDER opposed 80 cu. in. four-cycle air-cooled engine for light airplanes has been developed by H. E. Morehouse of the engine design branch, McCook Field. The new unit weighs 85 lb., develops 28 hp. at its rated speed of 2500 r.p.m. and is built to sell at $595.

The engine, except for the unusual feature of having a shorter stroke than bore, the bore being 3.750 in. and the stroke 3.620 in., does not represent any radical departures from tried aircraft engine design, and no attempts have been made to develop an engine giving the maximum horsepower obtainable per cubic inch and pound, the chief object of the designer being the obtaining of absolute dependability. To this end special attention has been given those parts which have proved troublesome in other designs of light plane air-cooled engines.

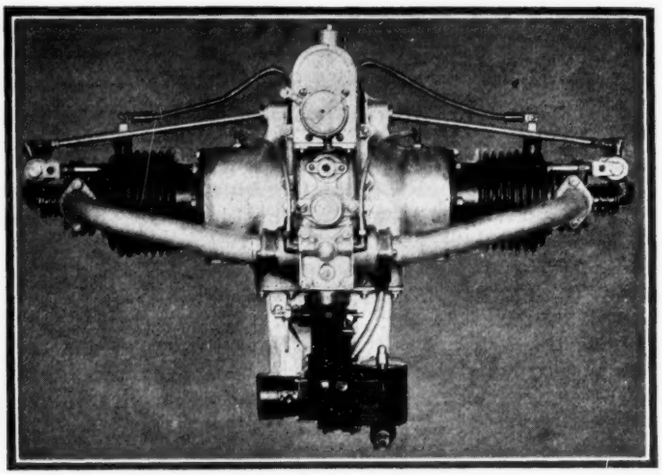
The cylinders are of cast iron with integral cooling fins, while the crankcase is a single aluminum casting with the cylinders projecting about half way into the crankcase, the barrels forming, when assembled, a closed compartment into which the oil from a by-pass valve is sprayed. There is a larger opening at the front end of the crankcase to facilitate assembly of the crankshaft and connecting rods. The camshaft is assembled from the rear end of the crankcase and is parallel to and above the crankshaft. The counterbalanced crankshaft has two throws of 180 deg., the crank pins being narrow and large in diameter to reduce the offset between the cylinders and still maintain the requisite bearing surface.

Automobile Crankcase Design

The crankcase design follows in general the design of automobile crankcases. The oil sump is attached from below and is easily removable for inspection of all parts. About three quarts of oil are carried directly in the oil sump, a filter screen being provided as well as provision for the installation of an oil thermometer. A combination breather and oil filler is mounted on top and cooling fins are provided at the bottom of the crankcase.

The pistons are made of aluminum, are equipped with three compression rings and one oil scraper ring and give a compression ratio of 5.0 to 1. The timing gear train consists of three spur gears, the crankshaft gear driving an idler at 2 to 1 and the idler driving the camshaft gear at 1 to 1. The camshaft, which also drives the Scintilla magneto, which furnishes ignition by means of a single spark plug in each cylinder, is in addition provided with a tachometer drive. The cams, which have a base circle of 1.062 in. and are 0.500 in. wide, operate flat-ended followers inside the crankcase which in turn operate the valves by means of push rods and rocker arms, means for adjusting tappet clearances being provided on the push rods.

The standard practice of providing a roller at the valve end of the rocker arm is followed. The valves are of cobalt chrome steel, with seats ground at an angle of 45 deg., 0.125 in. wide, the valve lift being 0.375 in. The valve guide bushings are removable to permit easy replacement. The rocker arm brackets are not integral with the head but are attached to it with a single stud.



Morehouse light plane engine

The timing of the engine, the inlet opening 10 deg. before top center and closing 50 deg. after bottom center and the exhaust opening 58 deg. before bottom center and closing 14 deg. past top center, is so arranged that a peak of about 116 lb. per sq. in. is obtained in the B.M.E.P. curve at about 2250 r.p.m., at which speed the engine develops about 26 hp.

The fuel consumption at full throttle power during the dynamometer test of the first engine was satisfactory, the fuel consumption dropping off from a maximum of 0.625 lb. per brake horsepower-hour at 2100 r.p.m., as higher speeds were used, the specific consumption at 2500 r.p.m. being well below the 55 lb., using a 20 per cent benzol mixture.

A Stromberg carbureter with a 1¼-in. choke is used, separate manifolds carrying the mixture to the cylinders. Although doped fuel was used during the power tests of this engine, it is expected that the engine will successfully operate on commercial gasoline, as it is not likely that detonation will occur at full throttle power at 2500 r.p.m., the maximum B.M.E.P. at that speed being less than 115 lb. per sq. in.

A reduction gearing is now being experimented on which will increase the flying efficiency of this engine by reducing the propellor speed in the ratio of 2.74 to 1, adding the 14 lb. to the weight of the engine. Provision is made for a hand-operated crank at the rear of the engine.

A NOISE frequency analyzer has been developed by the Metropolitan Vickers Electrical Co. of London and has been found useful in checking the operating conditions of machinery. The noise of a machine or workshop is picked up by a magnetophone, amplified and received in a telephone in which the oscillations of a calibrated audio-frequency valve (detector) are super-imposed until beats are heard. Thus predominant noise frequencies are determined.

Europe Has Taken to the Light Car—

Could a Field Be Developed for It in America?

Company with strong foreign representation might build up export business with such a model and market it later in this country after reaching quantity production

By Norman G. Shidle

A NUMBER of American manufacturers have built up an export trade in really significant proportions in the last few years.

Suppose one of these companies with its distribution points established and its service facilities operating over wide areas should begin to manufacture a small, light car similar to those already in production by foreign manufacturers. Suppose it took this step because it found a considerable demand for such a product coming in from foreign representatives, and suppose it started out to sell this light car chiefly in foreign countries.

Wouldn't such a move on the part of an important American producer be likely to change the attitude toward the possibilities of selling such a car in this country which most automotive men have held up to the present time?

The light car has not lacked American proponents in the past. There has been no lack of automotive men to point out its advantages. But there have been plenty more to show why it couldn't be made a commercial success in this country. So far the second class undoubtedly has been right.

And it is not reasonable to expect that any design development will come quickly or go far without the driver of commercial and profit-making possibilities behind it. Perhaps the light car will get an initial impetus from the demands of the export market and from the attempt of some American maker to supply that demand.

American production methods applied to a light car for sale in the foreign field would provide a great initial advantage over foreign-built cars of similar character. Merchandising ability and organization, however, would be the determining factor in a venture of this kind as in any other in the automobile business today.

These facts must be recognized clearly because attempts to sell an American-built light car in foreign fields already have been made on one or two occasions without much success. The effort never has been made, however, by an organization which is already equipped for quantity production of standard models and possessed of a strong, stable foreign organization already engaged in successfully merchandising those standard models. More than one American maker has sales and service facilities which encircle the globe.

The really interesting thing about this speculative assumption is the possible effect it might have on light car development in this country. For a long time to come the foreign sales could hardly be expected to permit real quantity production in the sense that the term is applied today in connection with such companies as Ford, Chevrolet, Dodge and Willys-Overland. But with the rapid development which is taking place in automotive exports it is not out of reason to believe that production of such a car under the favorable auspices suggested might reach as high as 35,000 cars a year within five years. An output of this kind may quite properly be called quantity production because it is large enough to permit low overhead per car and low selling prices.

Should such a development take place, there are many reasons to believe that the light car might find a good market in the United States itself. The chief argument against such a car up to the present time has been that it couldn't be produced as cheaply as the Ford or several other low-priced cars, and that consequently it would fail. With a low price made possible through development of foreign sales, many of the arguments of the light-car proponents would gain in weight. Some of the more important of these are:

1. Increasing traffic congestion in cities makes desirable and necessary a smaller individual transportation unit.
2. Increasing congestion in living conditions make desirable a small car which can be garaged in a small space.
3. A light car is easier to handle, particularly for women.
4. A light car is eco-

IN France small, lightweight cars of the type discussed in this article have become the big production job of Citroen, Renault, Berliet, Peugeot and Mathis. In Italy a small Fiat is reported to be making rapid headway. In England a 7hp. Austin and an 8hp. Humber and others have been in production for some time.

These cars all have the same general characteristics. They are usually fitted with four-cylinder engines of 60 to 67 cu. in., the wheelbase varies from 88 to 105 in. and the track in most cases is about 47 in.

The smallest engine fitted to an American built car at the present time has a piston displacement of 145 cu. in. and is of the six cylinder type. The smallest four cylinder engine on a standard car has a displacement of 154 cu. in. The shortest wheelbase used on this side is 100 inches. The track of all cars, regardless of size, has remained unchanged from the original 56 to 56½ in.

nomical to run, fuel, tire and other regular operating expenses being much lower than on larger cars. Possibilities of higher gasoline prices as the supply becomes more scarce makes fuel consumption a factor of growing rather than of diminishing importance.

5. Growth of good roads in the United States has been so rapid that a car of great ruggedness and ability to stand punishment is not necessary in many parts of the country today.

The light car cannot be said to have had any opponents, but there have been and still are many skeptics as regards its success. The chief contentions of the skeptics has been:

1. A light car couldn't be built at a cost which would give it any price advantage over standard cars now built in America. Without that price advantage its market would be very limited, as its advantages are not such as would make many people pay extra for it.

2. The advantage of low operating cost doesn't amount to much in the United States because gasoline prices are low, and it will be a long while before they get high enough to make much real difference.

American Wants Power

3. The American driver has been brought up on plenty of power. He expects to take every hill on high, and simply wouldn't be bothered with a low-powered car which necessitated constant gear changing.

4. The American driver wants a rugged vehicle which will withstand rough roads and high speed operation in bad country.

Whatever the doubters may say, the possibilities of an American-built light car has intrigued the minds of many intelligent automotive men for a long while. Recognizing the commercial difficulties, still they have found it hard to stop thinking about the subject.

Every time an American automotive executive goes abroad he comes home with more thoughts about light cars. Probably few automotive travelers exist who have not speculated considerably about how a light car might be put over in this country. So far none of the important companies have tried it.

America has given to the world low-cost individual transportation. Perhaps the world in turn will help America develop a new type of individual transportation for itself. Stranger things have happened.

Selden Has New Bus Chassis

A SPECIAL bus chassis designed for use with 18 to 21 passenger bodies has been developed by the Selden Truck Corp., Rochester, N. Y. A pressed steel frame 5¾ in. by 3½ in. by ¼ in., with a kick-up over the rear axle, and long, flat, underslung springs gives a low chassis with good riding qualities. Frame height at the rear is 24½ in.

A heavy-duty Clark spiral bevel drive rear axle, with cast steel housing, Timken bearings throughout and double bearings on the outer ends of the drive shafts are used. Brakes are internal expanding on rear wheels. Brown Lipe multiple disk clutch and selective transmission are used.

The motor is a Continental, 6-cylinder 3⅜ in. by 4½ in. with removable head, 4-bearing crankshaft and full pressure lubrication. It develops 55½ hp. at 2300 r.p.m., centrifugal pump cooling system, Stromberg carbureter, North East battery type ignition, Stewart vacuum tank fuel feed, Ross steering gear, Van steel wheels, and 36 by 6 in. pneumatic tires front and rear are used.

Wheelbases of 160 in. and 184 in. are furnished. Chassis weight is 3600 lb. Recommended body capacity is from 18 to 21 seated passengers with standing room. Standard equipment includes Bosch horn, Willard storage battery, speedometer, Motometer, mirror, front bumper, spare rim, Alemite grease gun and oil pressure gage. The chassis list price is $2,175 f.o.b. Rochester.

View of the New Ford Plant in the Suburbs of Paris

HAVING purchased the modern factory of the Oxylithe Company, Quai Aulagnier, Asnieres, in the northern suburbs of Paris, the Ford Company this year secures a position in the midst of the French automobile producing center and will abandon its old location at Bordeaux. The new factory buildings were erected during the war and are of a very modern type with every convenience for economical production. The total area of the site is 20 acres, of which about half is covered with buildings. With this plant Ford production in France can be increased from the present 100 cars per day to 300 per day, with a possible production of 500 per day. The factory will supply France and French colonies only.

"The work of fitting up the new factory already has begun and probably will be completed between July 1 and Aug. 1 of the present year. This is the first important step in the development of our plan to make the Ford a 100 per cent French car," said J. J. Harrington, European manager of the Ford Company.